# OPERATING INSTRUCTIONS FOR

# SSG 520

# SYNTHESIZED SIGNAL GENERATOR

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## SCHEDULE OF EQUIPMENT

**The complete equipment comprises:—**

a) 1 off SSG520 signal generator (with options if ordered)

b) 1 off mains cable

c) 1 off lead — b.n.c. to b.n.c.

d) 1 off lead — b.n.c. to open end

e) 1 off N male to b.n.c. female adaptor

f) 1 off 20dB, 50Ω b.n.c. male to b.n.c. female attenuator

g) 1 off mains tap selector card puller

h) 1 off plastic accessory wallet

i) 1 off instruction book

j) 1 off service manual

k) Multipin programme plug (Amphenol 57—30500 50 way)
(supplied only if programmability option fitted on unit)

Optional accessories (NOT supplied unless ordered)

1) Padded carrying case (p.v.c.) for protection in transit

2) Hard carrying case (metal) for protection in transit or storage.

3) Rack mounting kit (option E)

# INTRODUCTION

The SSG520 is a very easy to use synthesizer with an output range of 10–520MHz and provides full signal generator facilities. The r.f. performance is very good with particularly low leakage levels enabling accurate output level settings to be obtained and the high stability synthesized operation gives precise clean output frequencies.

The output is available via a type N connector and is selectable as a single range with a bank of seven easily read thumbwheel switches. These switches enable the output frequency to be dialled or reset to a resolution of 100Hz very quickly. They may be set in any order at any time and with any frequency step from the smallest (100Hz) to the largest (10 to 520MHz).

Once set the switches act as the generator memory and ensure the instrument will always return to this frequency, without subsequent attention after a power interruption.

L.E.D. lamps provide information regarding the validity of the output frequency. One illuminates when the synthesizer has locked at the requested frequency and another illuminates if an output higher than 520MHz or lower than 10MHz is dialled.

The output level controls are comprehensive with two rotary switches giving a total attenuation range of 119dB in 1dB steps. Dual output scales are provided giving simultaneous indications of voltage pd and dBm (both 50Ω). In addition an output meter gives continuous indication of the presence of r.f. output. The meter, in conjunction with an r.f. fine level control enables the main output attenuator to be calibrated and also gives output level control between the 1dB attenuator steps.

Full modulation facilities are available with four ranges of f.m. and one of a.m. The a.m. and f.m. controls are completely independent allowing them to be set at any level from either the internal two frequency oscillator or an external signal. An internal oscillator output is also provided.

The modulation is monitored by a meter and function select switch. This meter indicates the amount of modulation whether it is derived from internal or external sources.

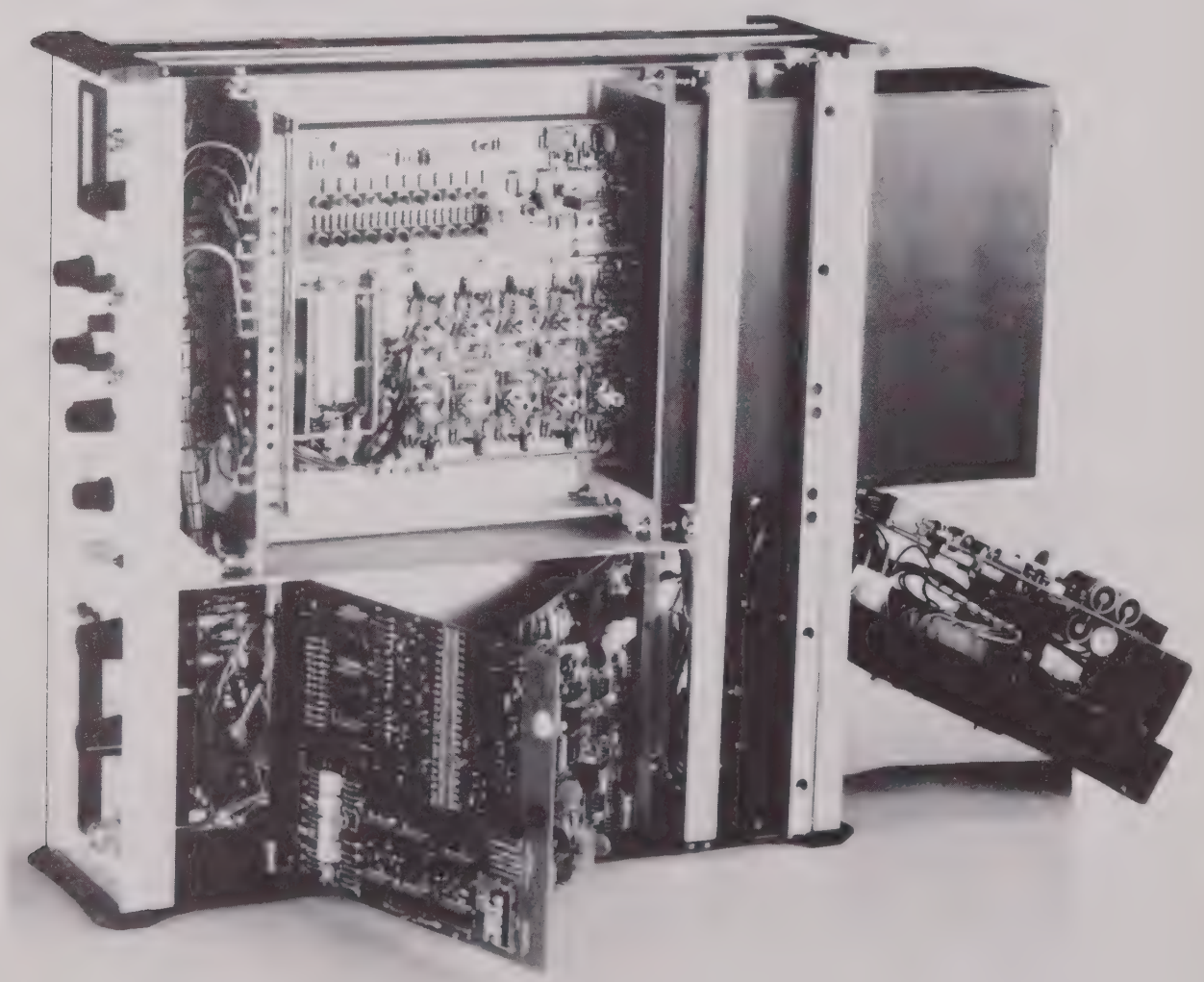
A very useful additional feature is the inclusion of a 1kHz automatic distortion meter. This allows the measurement of receiver SINAD ratios. (The ratio of signal plus noise plus distortion to noise plus distortion). The receiver audio output is automatically level sensed and the 1kHz fundamental removed. The meter then displays the SINAD ratio in dB. No frequency or level tuning is required.

If the remote programme option is fitted then all major functions can be controlled via a multipin socket. These include, frequency, attenuation, modulation and SINAD meter.

Internal reverse power protection is available (option D) and when fitted gives protection against possible attenuator burn-out for up to 50 watts reverse power. The protection automatically resets when the power signal is removed.

Auxiliary features available on the rear panel are the internal crystal reference output, an automatic override external reference input and an input enabling the signal generator to be swept at fast and slow speeds. The rear panel also carries the four position mains voltage tap setting, and the remote programme socket (if fitted).

The engineering is of a very high standard. Special emphasis has been placed on ease of service by making all parts simple to reach and replace. Use has been made of plug-in circuit boards and integrated circuit sockets wherever possible and no special service tools are required.



## SPECIFICATION

| | |
|---|---|
| FREQUENCY RANGE | 10 to 520MHz |
| RESOLUTION | 100Hz |
| STABILITY | As internal or external reference |
| ACCURACY | As internal or external reference |
| STABILITY OF INTERNAL CRYSTAL REFERENCE | *Standard:* Ages $<2$ ppm per year. Temperature coefficient $<3 \times 10^{-7}$ per $^{o}C$ *Option A:* Ages $<1$ ppm per year Temperature coefficient $<3 \times 10^{-9}$ per $^{o}C$ |
| ACCURACY OF INTERNAL CRYSTAL REFERENCE | *Standard:* $\pm 2 \times 10^{-6}$ *Option A:* $\pm 2 \times 10^{-7}$ ex factory at $20^{o}C$ |
| FREQUENCY CONTROL | Seven digit thumbwheel switch bank. Most significant digit limited to 5. All others unrestricted rotation. |
| FREQUENCY LOCK INDICATION | LED lamps confirm lock has been achieved and indicate out-of-range frequency conditions |
| LOCK AQUISITION TIME | Approximately proportional to frequency step demanded:– 100Hz and 1kHz steps : 200mS typical 10kHz and 100kHz steps : 2 secs typical 1MHz, 10MHz and 100MHz steps : 10 secs typical |
| OUTPUT LEVEL | 0dBm into 50Ω (224mV r.m.s. pd) with attenuation down to –119 dBm (0.2μV r.m.s. pd) in 1dB steps. In addition a continuous fine control is provided giving a range of at least + 6dB to – 3dB and a carrier off facility |
| OUTPUT ACCURACY | ±1dB at an output level of 0dBm from 10 to 520MHz |
| ATTENUATOR ACCURACY | ±0.2dB for any 1dB step ±2dB for any 10dB step |

| | |
|---|---|
| SOURCE IMPEDANCE | 50Ω. |
| HARMONIC CONTENT | Less than 25dB |
| RESIDUAL A.M. | Less than 0.5% |
| RESIDUAL F.M. | Approximately proportional to frequency. Measured in 15kHz f.m. bandwidth. Less than 20Hz peak deviation at 10 MHz. Less than 300 Hz peak deviation at 520 MHz. |
| CARRIER LEAKAGE | Less than 0.5μV induced in 2 turn 1" diameter loop 1" away from any surface of signal generator. Loop connected to 50Ω receiver. |
| A.M. DEPTH | 0 to 90% |
| A.M. ACCURACY | ±10% of reading ±5% of f.s.d. |
| A.M. BANDWIDTH | 20Hz to 50kHz (2dB) |
| A.M. DISTORTION | Less than 1.5% at 30% depth 1kHz<br>Less than 5% at 80% depth 20Hz–50kHz |
| EXTERNAL A.M. INPUT | 1V r.m.s. |
| EXTERNAL A.M. INPUT IMPEDANCE | >5kΩ a.c. coupled |
| F.M. DEVIATION | 0–3–10–30–100kHz peak |
| F.M. ACCURACY | ±10% of reading ±5% of f.s.d. > 30MHz<br>±15% of reading ±10% of f.s.d. < 30MHz |
| F.M. BANDWIDTH | 20Hz to 50kHz (2dB) |
| F.M. DISTORTION | Less than 1.5% 100kHz peak deviation, 1kHz<br>Less than 3% 100kHz peak deviation, 20Hz to 50kHz |
| EXTERNAL F.M. INPUT | 1V r.m.s. |
| EXTERNAL F.M. INPUT IMPEDANCE | > 5kΩ a.c. coupled |

| | |
|---|---|
| INTERNAL OSCILLATOR FREQUENCIES | 1kHz and 400Hz |
| INTERNAL OSCILLATOR OUTPUT LEVEL | 1V r.m.s. |
| INTERNAL OSCILLATOR OUTPUT IMPEDANCE | Less than 100Ω. Load >1kHz a.c. coupled |
| INTERNAL OSCILLATOR DISTORTION | Less than 0.5% |
| A.M. ON F.M. | Less than 2% for 50kHz peak deviation |
| F.M. ON A.M. | Less than 20 ppm |
| SINAD INPUT FREQUENCY | 1kHz (tracks with internal 1kHz modulation oscillator) |
| SINAD INPUT LEVEL | 50mV r.m.s. to 3V r.m.s. |
| SINAD INPUT IMPEDANCE | >5kΩ a.c. coupled |
| SINAD MEASUREMENT RANGE | 6 to 30dB |
| EXTERNAL SWEEP INPUT | −5V to +5V gives at least +1MHz to −1MHz dispersion |
| EXTERNAL SWEEP INPUT IMPEDANCE | >5kΩ d.c. coupled |
| LOCK DISABLE INPUT | CMOS (+15V). 0V to disable synthesizer, d.c. coupled |
| INTERNAL REFERENCE FREQUENCY | 2MHz |
| INTERNAL REFERENCE OUTPUT LEVEL | CMOS (0 to +15V) d.c. coupled |
| EXTERNAL REFERENCE FREQUENCY | 1MHz |
| EXTERNAL REFERENCE INPUT LEVEL | 1 to 15V peak to peak square wave |
| EXTERNAL REFERENCE IMPEDANCE | >5kΩ d.c. coupled |

| | |
|---|---|
| INTERNAL REVERSE POWER PROTECTION (option D) | If fitted gives protection against attenuator burn-out up to 50 watts reverse power. Protection automatically resets when power signal removed. |
| PROGRAMMABILITY (option B) | If fitted, gives remote control of frequency (7 digits), attenuation (10 and 1dB steps) and modulation (on/off). Outputs are also provided of synthesizer 'locks', 'overrange' and 'underrange' lamps, SINAD a.g.c. lamp, SINAD meter reading and necessary power rails |
| OPERATING AMBIENT TEMPERATURE RANGE | 0 to 40°C |
| MAINS SUPPLY REQUIREMENT | 100, 120, 220, 240V a.c.<br>Tolerance +6 to −10%<br>48 to 440Hz. 30VA approx. |
| MAINS FUSE | 250mA for 220 and 240V a.c.<br>500mA for 100 and 120V a.c. |
| MAINS CABLE | Detachable. Fitted with standard three pin C.E.E. approved connector |
| DIMENSIONS/WEIGHT | Height 137 mm<br>Width 440 mm<br>Depth 440 mm<br>Weight 13.8 kg |
| SHIPPING WEIGHT/ BOX SIZE | Weight 17 kg<br>Height 230 mm<br>Width 570 mm<br>Depth 570 mm |
| ACCESSORIES (supplied free with instrument) | Mains cable<br>Lead – b.n.c. to b.n.c.<br>Lead – b.n.c. to open end<br>N male to b.n.c. female adaptor<br>20dB, 50Ω b.n.c. male to b.n.c. female attenuator<br>Mains tap selector card puller<br>Plastic accessory wallet<br>Instruction book<br>Service manual |

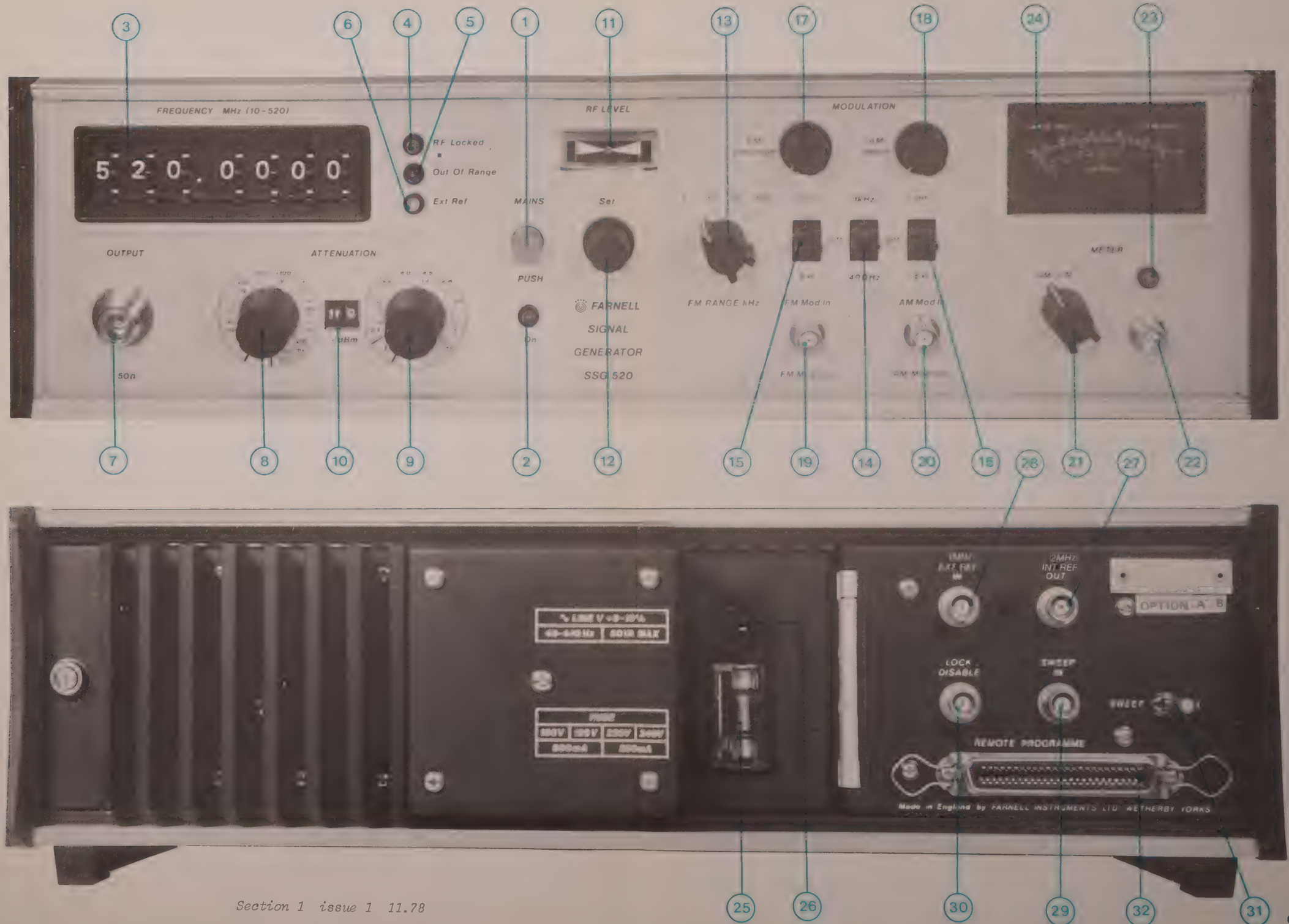
# IDENTIFICATION OF CONTROLS ETC.

**Front Panel**

1) Mains switch. Push on/off.
2) Mains on indication L.E.D. lamp.
3) Bank of seven thumbwheel switches setting output frequency
4) Lock lamp. L.E.D. illuminates when output frequency is locked to crystal reference
5) Out of range lamp. L.E.D. illuminates when thumb-wheels set out of instrument frequency range
6) External reference lamp. L.E.D. illuminates when instru-ment has external reference source connected.
7) R.F. output connector. Type N 50Ω
8) R.F. output attenuator. 10dB steps. Scale carries colour coded multiplier for 1dB step voltage scale
9) R.F. output attenuator. 1dB steps. Scale carries colour coded voltage scale (pd, 50Ω) to be multipliedby scale on 10dB step attenuator
10) dBm output level. In the window can be seen the instru-ment r.f. output level in –dBm, 50Ω
11) R.F. output level meter
12) R.F. output level adjustment control and carrier off switch. Calibrates output attenuator scales and allows interpolation between 1dB steps.
13) F.M. range switch giving four sensitivity settings
14) Internal oscillator switch. Three positions giving 1kHz, 400Hz and off
15) F.M. select switch. Three positions giving choice of internal modulation source, external source or off.
16) A.M. select switch. Three positions giving choice of internal modulation source, external source or off.
17) F.M. deviation control
18) A.M. depth control
19) B.N.C. socket allowing the connection of an external f.m. source. Also doubles as the internal audio oscillator output.
20) B.N.C. socket allowing the connection of an external a.m. source. Also doubles as the internal audio oscillator output.
21) Meter select switch. Sets the meter to read modulation, internal or external, and the SINAD ratio.
22) B.N.C. input for SINAD measurements
23) SINAD input a.g.c. L.E.D. illuminates when input is within a.g.c. range.
24) Meter. Calibrated for a.m. depth, f.m. deviation and SINAD ratio.

**Rear Panel**

25) Sliding window covering mains tap select card and mains fuse
26) Mains input connector. Standard three pin C.E.E. approved type
27) Internal crystal reference output socket
28) External reference freq-uency input socket
29) B.N.C. socket enabling connecton of an external source to sweep the r.f. output
30) B.N.C. socket allowing the r.f. synthesizer lock mech-anism to be temporarily suspended at the last freq-ency for slow sweeping
31) Two position locking switch for the selection of f.m. operation (front panel controls) or sweep operation (rear panel controls)
32) Multiway programme socket (if fitted)


FREQUENCY MHz (10-520)
520.0000
RF Locked
Out Of Range
Ext Ref
RF LEVEL
MODULATION
MAINS
Set
PUSH
On
OUTPUT
50Ω
ATTENUATION
dBm
FARNELL
SIGNAL
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SSG 520
FM RANGE kHz
FM Mod In
AM Mod In
1kHz
400Hz
METER
2MHz
INT REF
OUT
OPTION A B
LOCK
DISABLE
SWEEP
REMOTE PROGRAMME
Made in England by FARNELL INSTRUMENTS LTD WETHERBY YORKS

# OPERATING INSTRUCTIONS

## Unpacking

The instrument has been carefully packed to prevent damage in transit. When removing the unit from the packing box, be sure that all parts and accessories are removed from the packing material. As soon as the instrument is unpacked, it should be inspected for possible transit damage.

In the event of damage in transit or shortage in delivery, separate notice in writing should be given to both the carriers and Farnell Instruments Limited, within three days of receipt of the goods, followed by a complete claim within five days. All goods which are the subject of any claim for damage in transit or missing items should be preserved intact as delivered, for a period of seven days after making the claim, pending inspection or instructions from Farnell Instruments Limited, or an agent of this Company.

## Initial setting up

Check the mains input setting is correct for the local supply by looking through the clear window below the mains input socket on rear panel.

One of four alternative settings will be visible. Should it be necessary to change the setting, slide the window upwards remove the fuse and then pull out the small selector card using the puller provided.

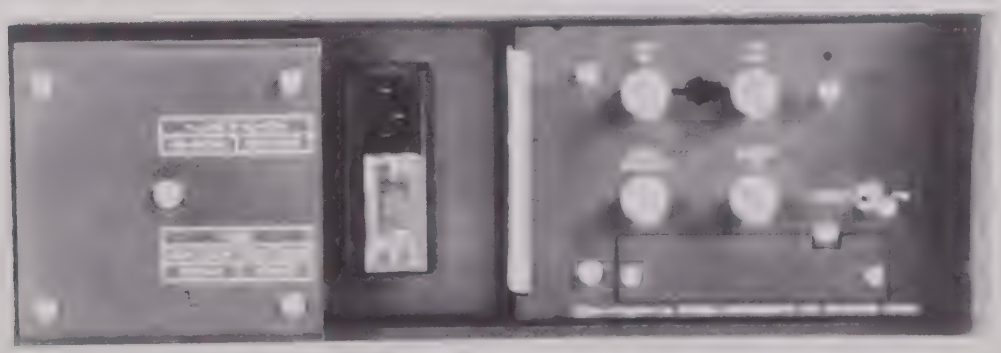
Re-insert the card in the appropriate alternative position so that the required voltage setting is visible when the card is fully replaced. Replace the fuse ensuring the rating is correct for the mains voltage to be used and slide down the window.

Connect a suitable mains plug to the mains cable observing the following colour code:—

| | | |
|---|---|---|
| Live | — | Brown |
| Neutral | — | Blue |
| Earth | — | Green/Yellow |

Plug mains cable into socket on rear of instrument and to power source.

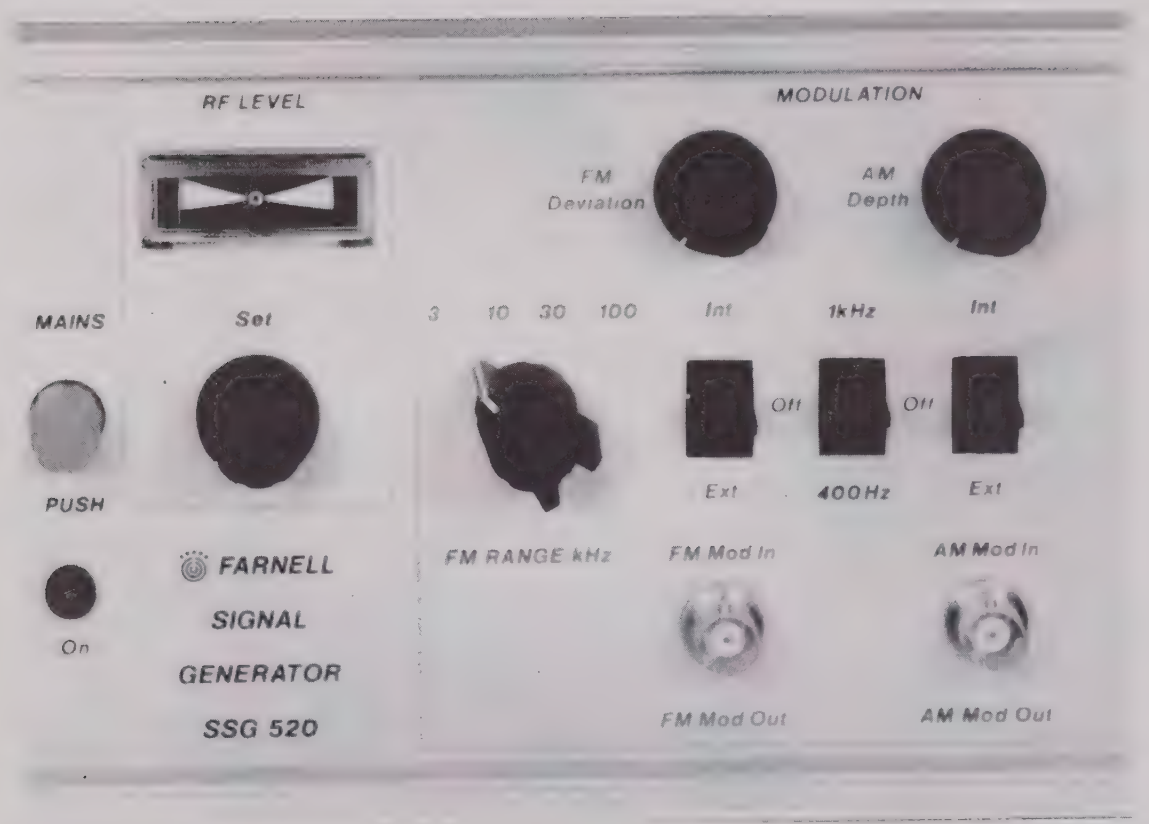
Check that the rear panel self-locking switch is set to 'FM'. Pull the switch lever outwards to unlock it for resetting. The spring loaded lever will re-lock itself.



Turn off the three modulation select switches by putting them in the central position.

Press the mains push-button. The mains l.e.d. will light.

Using the r.f. level 'Set' control set the output level meter to read centre scale.



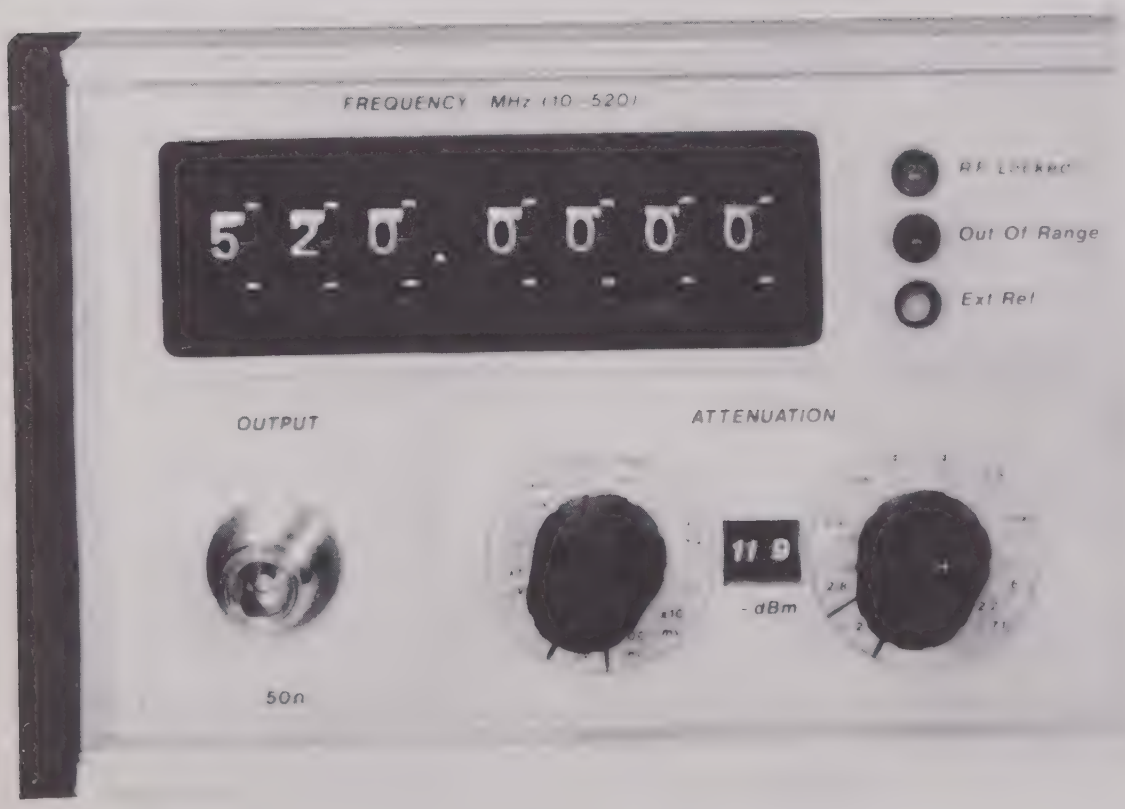
## Frequency

Select the required output frequency on the seven section thumbwheel switch bank. The segments may be set in any order at any time. The hundreds of megahertz digit is mechanically stopped at 0 and 5 but all other decades can be continuously rotated either up or down in frequency. The instrument is auto frequency ranging so any frequency step can be demanded.

The green r.f. lock lamp will extinguish whilst the frequency is being found and illuminate continuously when lock has been achieved. The time required to perform a frequency change depends mainly upon the step size. A step of 1MHz or larger will initiate an automatic calibration of the frequency modulation and sweep. (Patent applied for). This calibration results in two brief 'blinks' of the lock lamp prior to final lock being achieved although in some cases the second 'blink' is so close to the lock lamp finally illuminating continuously it cannot be perceived.

A red, 'out of range' l.e.d. will illuminate if the thumbwheels are set to a figure higher than 520.9999 or lower than 10.0000. The synthesizer remains operative however, so lock may be obtained outside these limits. It is in order to use the instrument under these conditions although the specifications will not apply.

Because the most significant digits have the longest lock time it is both convenient and quickest to set a new frequency starting with these digits and proceeding down to the least significant figures.



## Output level

The r.f. level 'set' control is used initially to calibrate the step attenuator scales. Adjust the 'set' control until the output edge-meter is reading centre scale. The 10dB and 1dB step attenuators may then be used to obtain the desired output level. There are two level scales on the attenuators, giving readings in dBm and volts pd (both 50Ω). The dBm figure is readable directly in the window between the attenuator controls and the voltage figure is obtained from both the scales surrounding the attenuator controls. The left hand 10dB step scale shows a multiplier reading. A colour code has been incorporated because each 1dB step carries two voltage figures – one in red, the other in black. Use the figure which is the same colour as the multiplier shown by the 10dB step attenuator.

The carrier may be switched off without disturbing the attenuator setting or lock condition by rotating the 'set level' control to the extreme left to operate the integral 'carrier-off' switch.

For level adjustments between the 1dB steps provided by the main attenuator, the 'set level' control may be used. Away from the centre scale position the a.m. performance may be impaired but other functions remain unaffected. Limited amounts of a.m. may be used however with the meter set away from centre scale thus enabling a.m. to be applied at output levels greater than 0dBm. For example, with the meter set at 75% f.s.d. approx. 50% a.m. will be available.

Another function of this control is to provide up to twice the normal output level (i.e. +6dB). This is obtained when the meter is set to f.s.d. No a.m. performance will be obtainable under these conditions.

The 'set' control is operable at all r.f. levels obtained by the use of the step attenuator and so can be used to obtain less than the calibrated minimum attenuator output of 0.2μV.

## Amplitude modulation

The controls associated uniquely with a.m. are colour coded blue. Set the meter to read a.m. by switching the meter select switch to 'AM'. Switch the internal oscillator on by selecting either 1kHz or 400Hz frequency. If an external modulation source is to be used the internal oscillator may be left off although this is not essential.

Select either internal or external modulation. If internal modulation is being used adjust the a.m. depth control until the meter indicates the desired modulation depth. The internal oscillator frequency will be available at the internal a.m. output b.n.c.

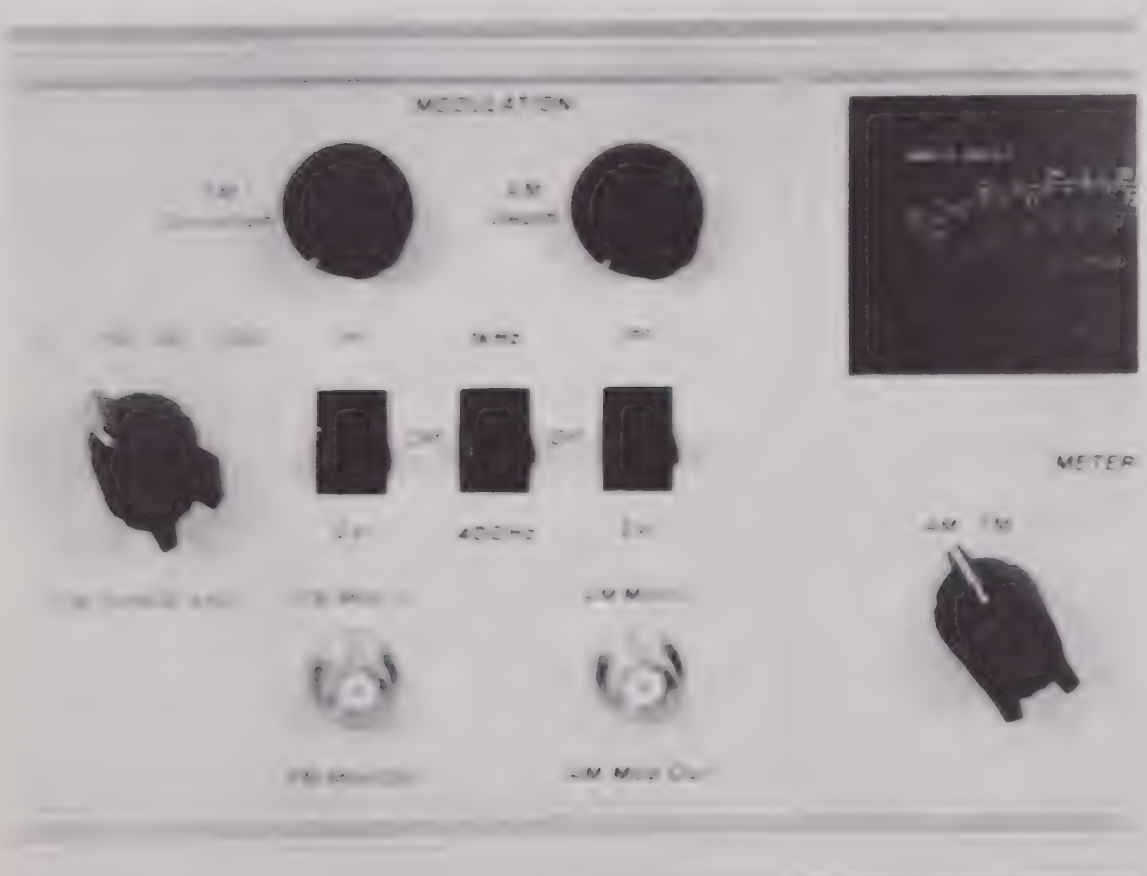
For external modulation connect the external source to the a.m. input b.n.c. at a level of 1V r.m.s. Use the a.m. depth control and meter as above. If the level of the external source is not known adopt the following procedure to avoid overdriving the input amplifier. Set a.m. depth control fully clockwise. Increase the level of the external signal until the meter reads f.s.d. Use the a.m. depth control to set the required depth on the meter.

## Frequency modulation

The controls associated uniquely with f.m. are colour coded green. Set the meter to read f.m. by switching the meter select switch to 'FM'. Switch the internal oscillator on by selecting either 1kHz or 400Hz frequency. If an external modulation source is to be used the internal oscillator may be left off although this is not essential.

Select either internal or external modulation. Using the f.m. range switch select the meter f.s.d. most suitable for the deviation to be used. If internal modulation is being used adjust the f.m. deviation controls until the meter indicates the desired peak deviation. The internal oscillator frequency will be available at the internal f.m. output b.n.c.

For external modulation connect the external source to the f.m. input b.n.c. at a level of 1V r.m.s. Use the f.m. deviation control and meter as above. If the level of the external source is not known adopt the following procedure to avoid overdriving the input amplifier. Set the f.m. deviation control fully clockwise. Increase the level of the external signal until the meter reads f.s.d. Use the f.m. deviation control to set the required deviation on the meter.



### Multiple modulation

Since the a.m. and f.m. circuits are equipped with individual selection and level controls, then any combination of simultaneous a.m. and f.m. is possible. The sources can be internal, external or both with each type of modulation separately set and metered.

### SINAD measurements

The controls associated uniquely with the SINAD metering function are colour coded **orange**.

The term SINAD is derived from the expression:—

SIgnal plus Noise And Distortion. The SINAD ratio, expressed in dB, is given by the following equation:—

$$\text{dB SINAD} = 20 \log_{10} \frac{(\text{Signal + Noise + Distortion})}{(\text{Noise + Distortion})}$$

The SINAD meter in the SSG520 is designed to directly measure the SINAD ratio of a 1kHz signal. It does this by applying a wide range a.g.c. to the signal to fix the value of the numerator in the above equation to a constant, say C.

$$\text{Thus dB SINAD} = 20 \log_{10} \frac{C}{(\text{Noise + Distortion})}$$

$$\text{or dB SINAD} \propto \log_{10} \frac{1}{(\text{Noise + Distortion})}$$

The 1kHz fundamental is then notched out and the remainder (i.e. the denominator in the above equation) displayed on the meter. Since the meter has a reciprocal logarithmic scale:—

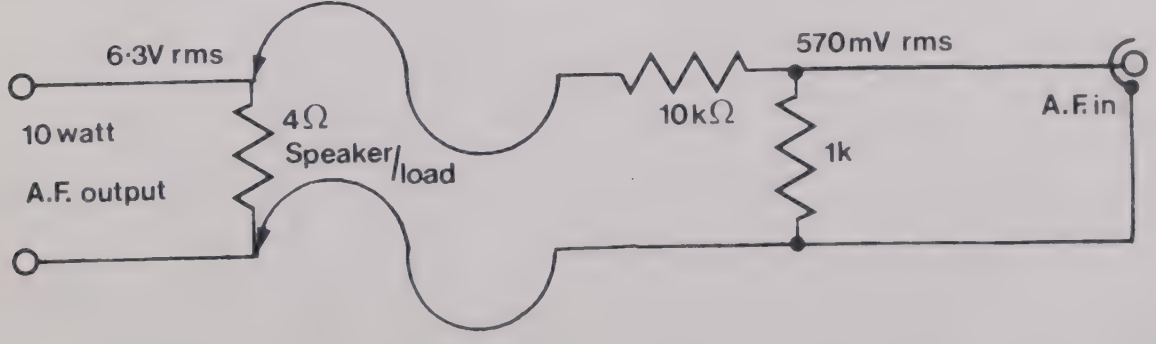
$$\text{dB SINAD} \propto \text{meter reading}$$

The most common SINAD measurement is the 12dB SINAD sensitivity of f.m. receivers. To measure this, the SSG520 r.f. output is connected to the receiver aerial input and a strong signal injected with the frequency set to correspond to the appropriate channel frequency. The generator signal should be frequency modulated at 1kHz using the internal facility provided. This is because the SINAD meter 1kHz notch filter has been adjusted to follow the internal 1kHz oscillator.

Set the meter function switch to 'SINAD' after the modulation has been set up. Connect the SINAD 'AF IN' b.n.c. socket to the receiver loudspeaker terminals (or dummy audio load).

If the whole receiver is being evaluated, set the audio output to the maximum rated power. If the r.f. circuits only are of concern the audio output may be set at a comfortable level.

Adjust the audio output level if necessary so that the green SINAD a.g.c. l.e.d. is illuminated. This indicates the input level is within the instrument measurement range. When working at maximum rated output power, it may be necessary to attenuate the 1kHz by means of a simple resistive divider to bring the level within the a.g.c. range. An example is shown below.



If the receiver is operating normally a low SINAD meter deflection will occur. A high reading would indicate distortion is present.

The r.f. signal is then progressively reduced using the SSG520 output attenuator until the SINAD reading rises to 12dB. The output attenuator reading is then the 12dB SINAD sensitivity of the receiver. If the reading is much higher than expected it indicates a high r.f. output noise content.

The major advantage of a SINAD ratio meter is that it enables assessment of noise or distortion content, or both, since it is the combination of these which affects the final speech intelligibility.

An important note is that it is best to use the internal 1kHz source, since this has been designed to always fall within the SINAD meter filter. An external 1kHz may be used however provided that it can be tuned to give minimum SINAD meter deflections.

## Sweeping

The signal generator may be swept, whilst under locked conditions up to a maximum of ±1MHz peak deviation. The sweep input is located on the back panel and is selected by the self-locking switch. The switch lever must be pulled out to unlock for resetting. The sweep input is d.c. coupled and so there is no lower limit to the speed at which the r.f. oscillator can be swept. However, as the sweep rate is reduced below 20Hz, the synthesizer will progressively remove the effect of the sweep voltage.

Under these conditions, the sweep disable input on the back panel must be utilised if constant sweep dispersion is to be obtained. The disable control allows the synthesizer output voltage, which drives the r.f. oscillator, to be held constant while the sweep signal is being applied. In this state, the r.f. oscillator will be subject to normal free-running oscillator frequency drift, so it will be necessary to periodically release the disable input to allow the synthesizer to re-establish the correct centre frequency. This is best done at the end of each sweep, thus ensuring there is a frequency re-calibration at every sweep, although at wider sweep dispersions and higher sweep speeds, drift will not be a problem and the frequency re-locking can be done less frequently.

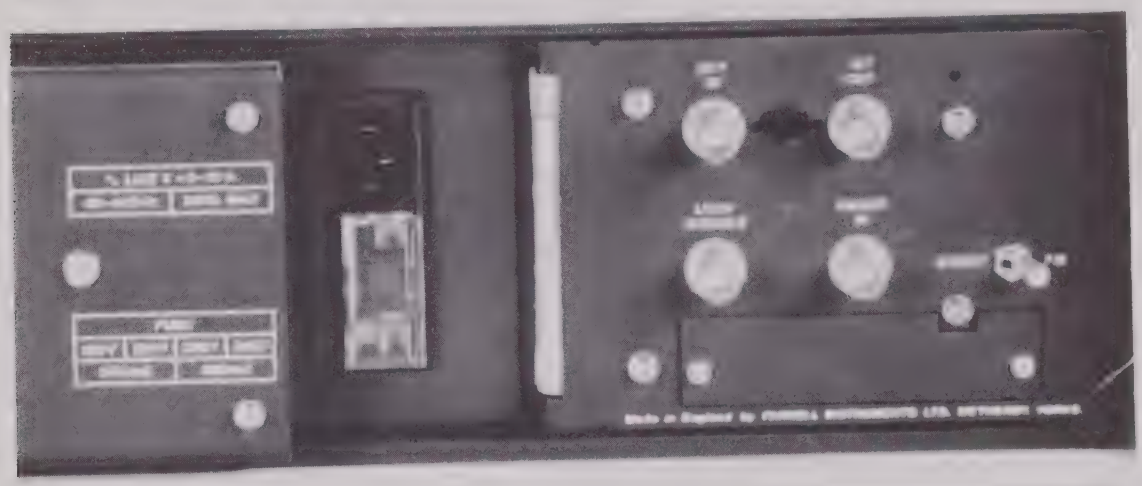
In use the rear panel self-locking switch is set to 'sweep' and the synthesizer first allowed to lock at the required centre frequency, and then disabled. Sweep may then be applied at the rear panel input and the synthesizer enabled periodically as and when necessary. The synthesizer can be set to another frequency during the sweep operations but it will only be operative of course when not disabled.

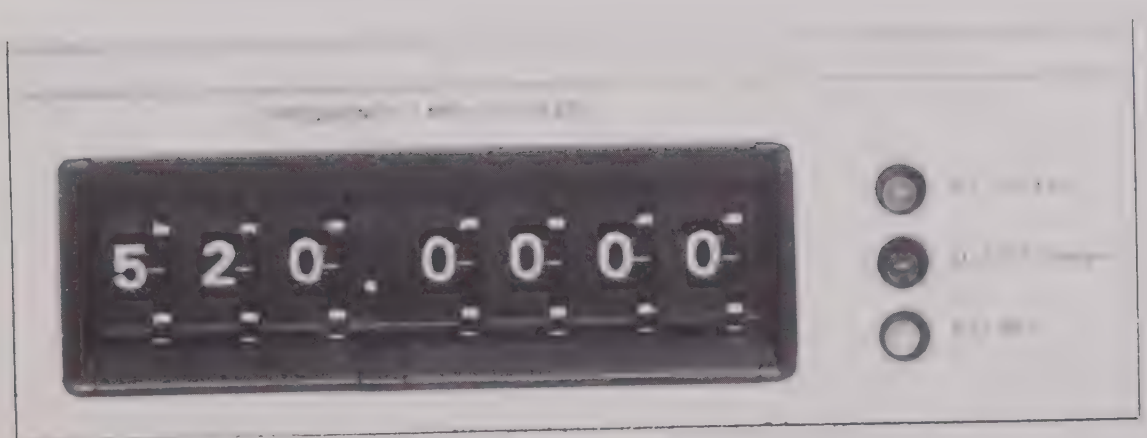
At sweep rates below 20Hz, the 'RF Locked' lamp may extinguish. This is because the synthesizer is working against the sweep signal to a certain extent and so gives out of lock indication. Provided lock is achieved before sweep commenced, the lamp can be ignored.

## Frequency reference

The internal crystal frequency reference is available via a rear panel b.n.c. socket. An external source may be used and should be connected to the rear panel input socket. The presence of this external signal will automatically change over the SSG520 reference source from internal to external. The front panel l.e.d. indicator lamp will illuminate.

The internal reference frequency is always available, whether using internal or external reference.





# MAINTENANCE

## Guarantee

The equipment supplied by Farnell Instruments Ltd. is guaranteed against defective material and faulty manufacture for a period of twelve months from the date of despatch. In the case of material or components employed in the equipment but not manufactured by us, we allow the customer the period of any guarantee extended to us.

The equipment has been carefully inspected and submitted to comprehensive tests at the factory prior to despatch. If, within the guarantee period, any defect is discovered in the equipment in respect of material or workmanship and reasonably within our control, we undertake to make good the defect at our own expense subject to our standard conditions of sale. In exceptional circumstances and at the discretion of the Service Manager, a charge for labour and carriage costs incurred may be made.

Our responsibility is in all cases limited to the cost of making good the defect in the equipment itself. The guarantee does not extend to third parties, nor does it apply to defects caused by abnormal conditions of working, accident, misuse, neglect or wear and tear.

## Maintenance

In the event of difficulty, or apparent circuit malfunction, it is advisable to telephone (or telex) the Service Department or your local Sales Engineer or Agent (if overseas) for advice before attempting repairs.

For repairs and re-calibration it is recommended that the complete instrument be returned to:—

The Service Department,
Farnell Instruments Ltd.,
Sandbeck Way,
Wetherby, West Yorkshire,
LS22 4DH.
Tel: 0937 63541 Telex: 557294 FARIST G

Please ensure adequate care is taken with packing and arrange insurance cover against transit damage or loss.

## OVERALL SYSTEM DESCRIPTION

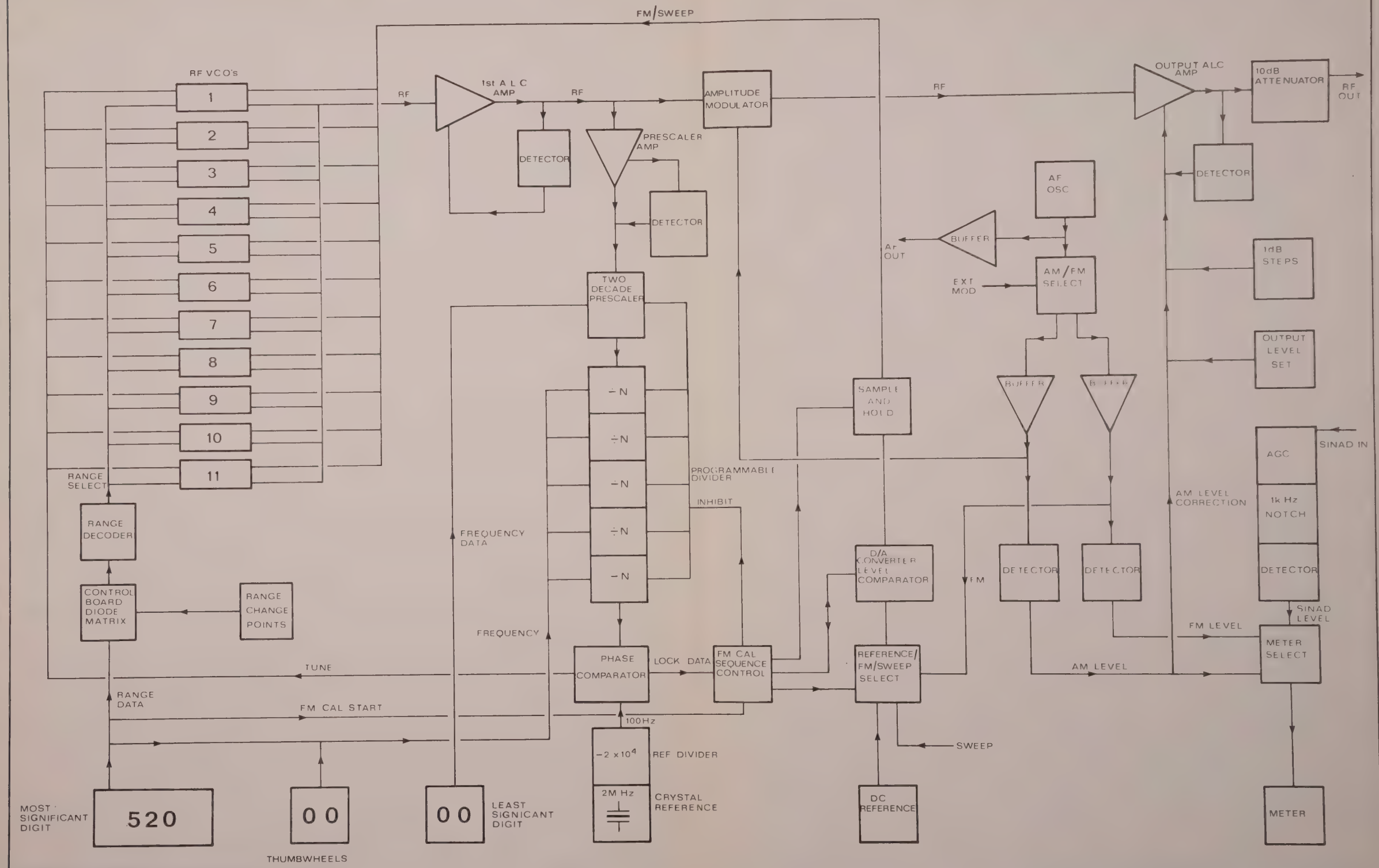
The SSG520 employs a single frequency/phase lock loop operating with 11 voltage controlled oscillators (VCO's), the highest of which uses resonant striplines in a tank circuit. Only one oscillator is operating at any one time, the selection being performed by the range control. The three most significant digits of the frequency selected by the thumbwheels are decoded by the range control board into one of eleven ranges. This range data is passed to the r.f. enclosure in four line binary form, there it is decoded by the range decoder into one of eleven for selection of the appropriate VCO.

The combined synthesizer and prescaler board contains a seven decade programmable divider chain operating on the output of the selected VCO and dividing it by the number set up on the thumbwheel switches. Due to its high toggling speed and r.f. radiation the prescaler board is positioned in the r.f. box separate from the synthesizer board. The synthesizer also contains a fixed divider chain to divide the two megahertz signal from the crystal reference board down to the 100 hertz comparison frequency. The crystal reference chain output and the programmable chain output are compared on the synthesizer board and any difference fed to the VCO's by the tuning line in order to correct the frequency. The tuning line is permanently connected to all the VCOs but will, of course, only influence the selected one.

Any change of data from the three most significant digits on the thumbwheels causes an f.m. calibration start signal to be passed to the f.m. correction board. This board utilises the synthesizer to find two frequencies one megahertz apart one of which is the required final frequency. It uses both VCO tune line and the VCO f.m. input line for this purpose. The sensitivity of the VCO to f.m. is thus sensed and the f.m. signalled from the audio board can be attenuated by the correct amount before passing along the f.m. line to the r.f. oscillators. The f.m. line is permanently connected to all eleven VCOs.

The audio board contains the internal modulation oscillators and SINAD measurement functions. Audio signals are selected and passed to the amplitude modulator or frequency modulation correction board as appropriate. Buffer amplifiers are positioned between functions for calibration and isolation purposes. There are meter detection circuits for modulation and SINAD display.

In the r.f. chain after the VCOs are: an amplitude modulator, output amplifier with a.g.c. and a 10dB step attenuator. The output a.g.c. has three uses. First it provides output levelling, second it is used as the fine output level vernier control and third the 1dB steps are provided by stepping the a.g.c. level in a logarithmic sequence. The first two functions are provided by the level control section located on the range control board. The 1dB steps are controlled from the front panel. The output step attenuator is selected by binary data from the front panel control.

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NOTE
CAPACITORS VALUES GIVEN IN
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UNLESS OTHERWISE STATED

FARNELL INSTRUMENTS LTD WETHERBY

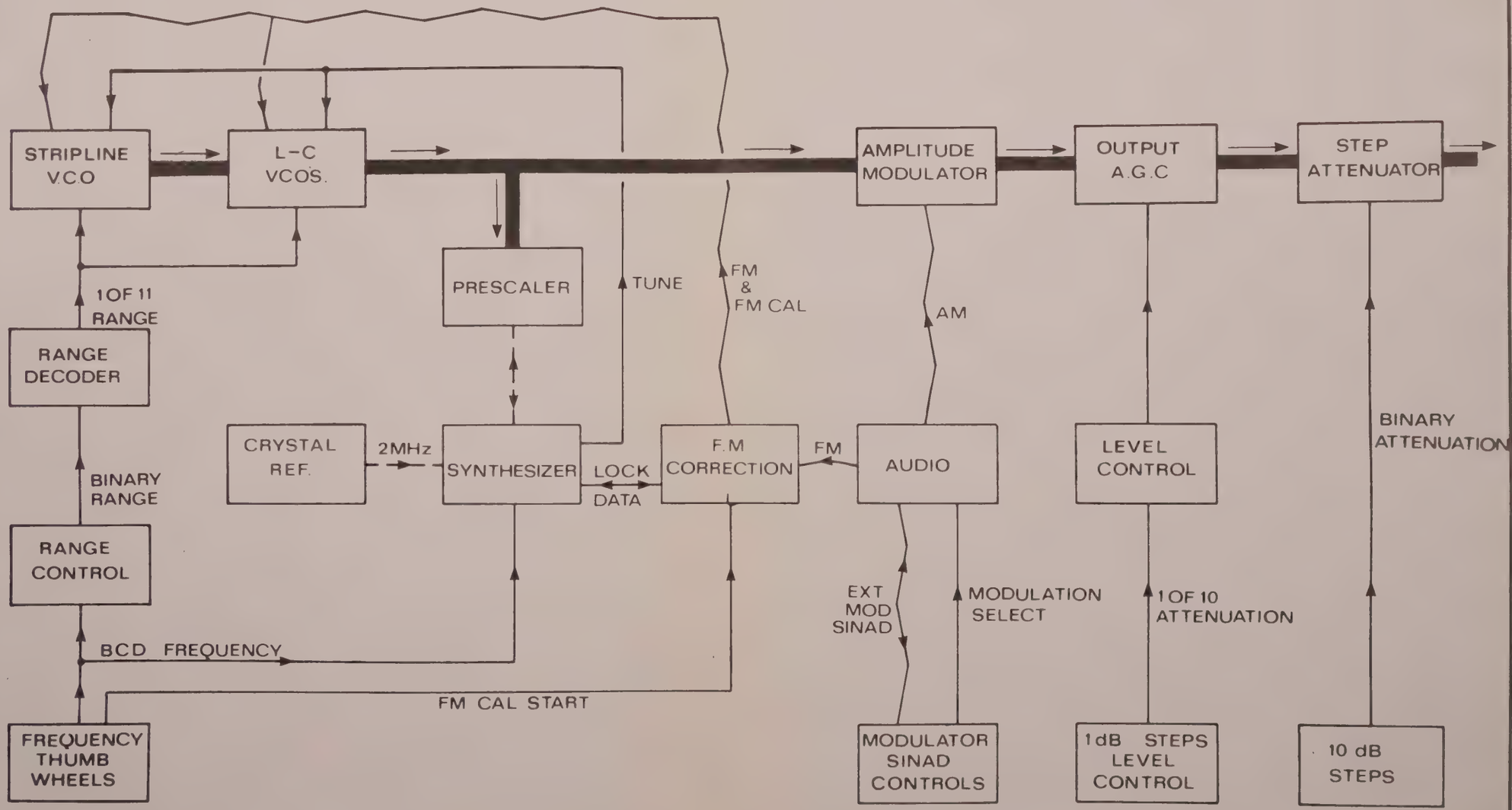
TITLE DETAILED BLOCK DIAGRAM
Section 2 issue 1 11·78

DRAWING NO
2ZVO832285

SHEET 1 OF 1 SHEETS

USED ON

DRAWING No. 3ZV0832282

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FARNELL INSTRUMENTS LTD. WETHERBY.

TITLE: OVERALL BLOCK DIAGRAM

SSG 520

DRAWING No. 3ZV0832282

Section 2 issue 1 11.78

## THE R.F. OSCILLATORS

### 1. *Stripline oscillator assembly*

The highest frequency oscillator (range eleven) is formed around a common source f.e.t. Feedback for oscillation is by gate and drain inductive lines coupled magnetically. The two coupled lines grounded at one end are less than a quarter wave length long and so appear inductive. This inductance resonates with capacitance diodes connected to the line ends. The use of a double tuned system increases the tank Q and thus lowers oscillator noise.

Tuning is accomplished by reverse biasing all the varactors with a voltage applied to the cathodes. Frequency modulation is performed by applying the audio signal to two of the reactor anodes suitably attenuated by a resistor potential divider so the varactors are never forward biased. A 'hard start' circuit fitted in the supply line forces the oscillator supply to maximum when first turned on and then slowly reduces it to the correct bias point. This minimises initial frequency drift and ensures accurate f.m. calibrations when range changing.

The r.f. output is taken from an auxiliary line coupled to the drain line.

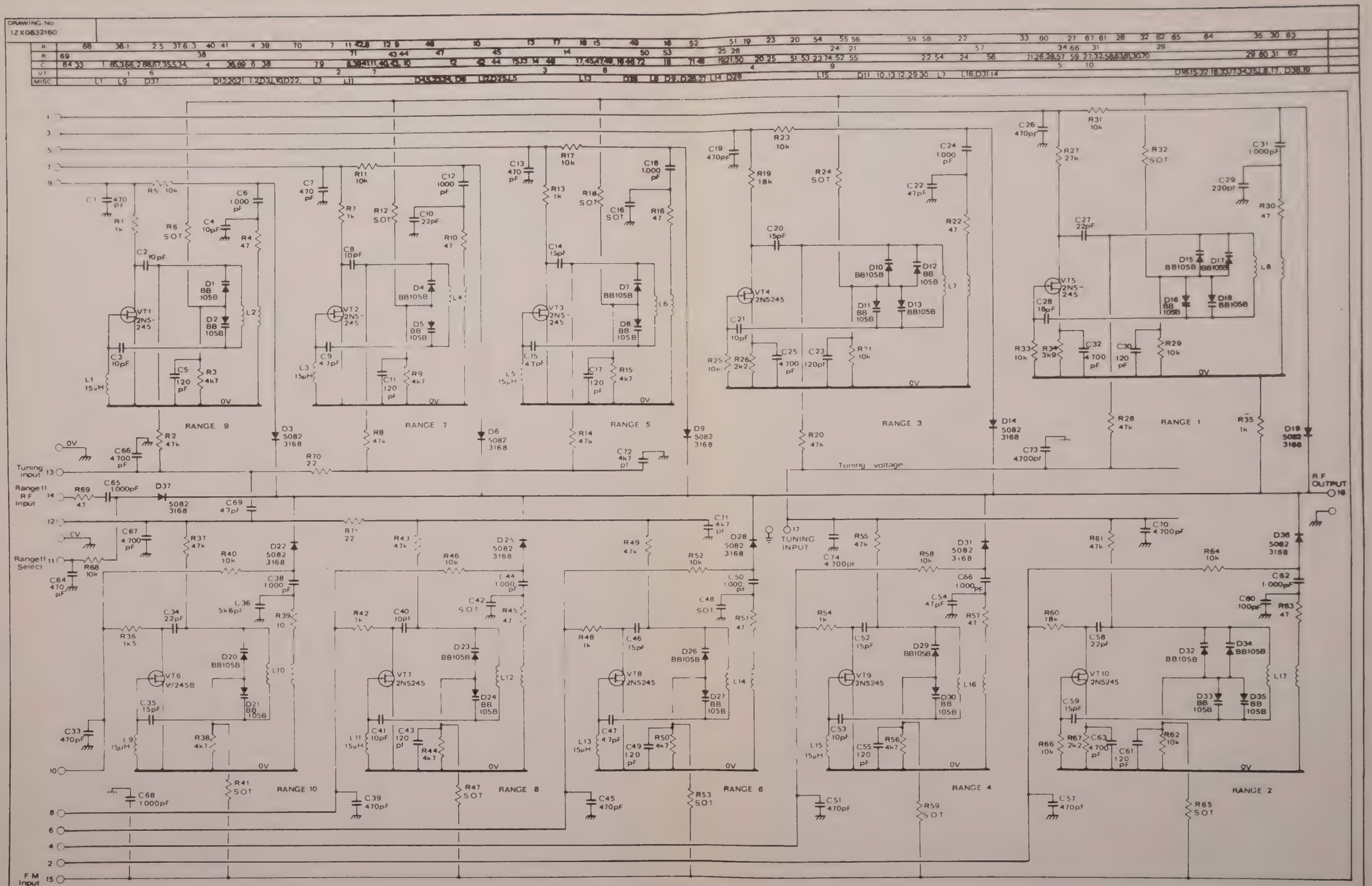
### 2. *Oscillator board*

The oscillator board contains ten separate oscillators. These oscillators (for ranges 1 - 10) in addition to the stripline oscillator (range 11) cover the entire output frequency range of the instrument on fundamentals. Each oscillator has a working frequency tuning range of approximately $\sqrt{2:1}$ up from its lowest frequency. A Colpitts configuration common source f.e.t. is used with varactor diodes as the tuning elements.

Tuning is performed by applying a positive voltage to the varactor cathode. Frequency modulation is accomplished by applying the audio signal to the varactor anode suitably attenuated by a resistor potential divider so that the varactors are never forward biased.

The ranges are selected by turning on the bias supply to the required f.e.t. The r.f. output is taken from each oscillator coil by inductive coupling and the harmonics suppressed by RC filtering. A PIN diode links each r.f. output to the common output track. The PIN diodes are forward biased to route the required oscillator out by the f.e.t. bias supply.

The r.f. output is then fed to the buffer amplifier and prescaler.


DRAWING No 1ZX0832160
RANGE 9
RANGE 7
RANGE 5
RANGE 3
RANGE 1
RANGE 10
RANGE 8
RANGE 6
RANGE 4
RANGE 2
Tuning input
Range 11 RF Input
Range 11 Select
FM Input
Tuning voltage
TUNING INPUT
RF OUTPUT
NOTE
ALL RESISTOR VALUES GIVEN IN OHMS
ALL CAPACITOR VALUES GIVEN IN µF
TOLERANCE
MATERIAL
SCALE
PROTECTIVE FINISH
DIMENSIONS IN MM
FARNELL INSTRUMENTS LTD. WETHERBY, YORKS.
TITLE
VARACTOR OSCILLATOR SSG520
CIRCUIT DIAGRAM
Section 3 issue 1 11·78
DRAWING No
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SHEET 1 OF 1 SHEETS
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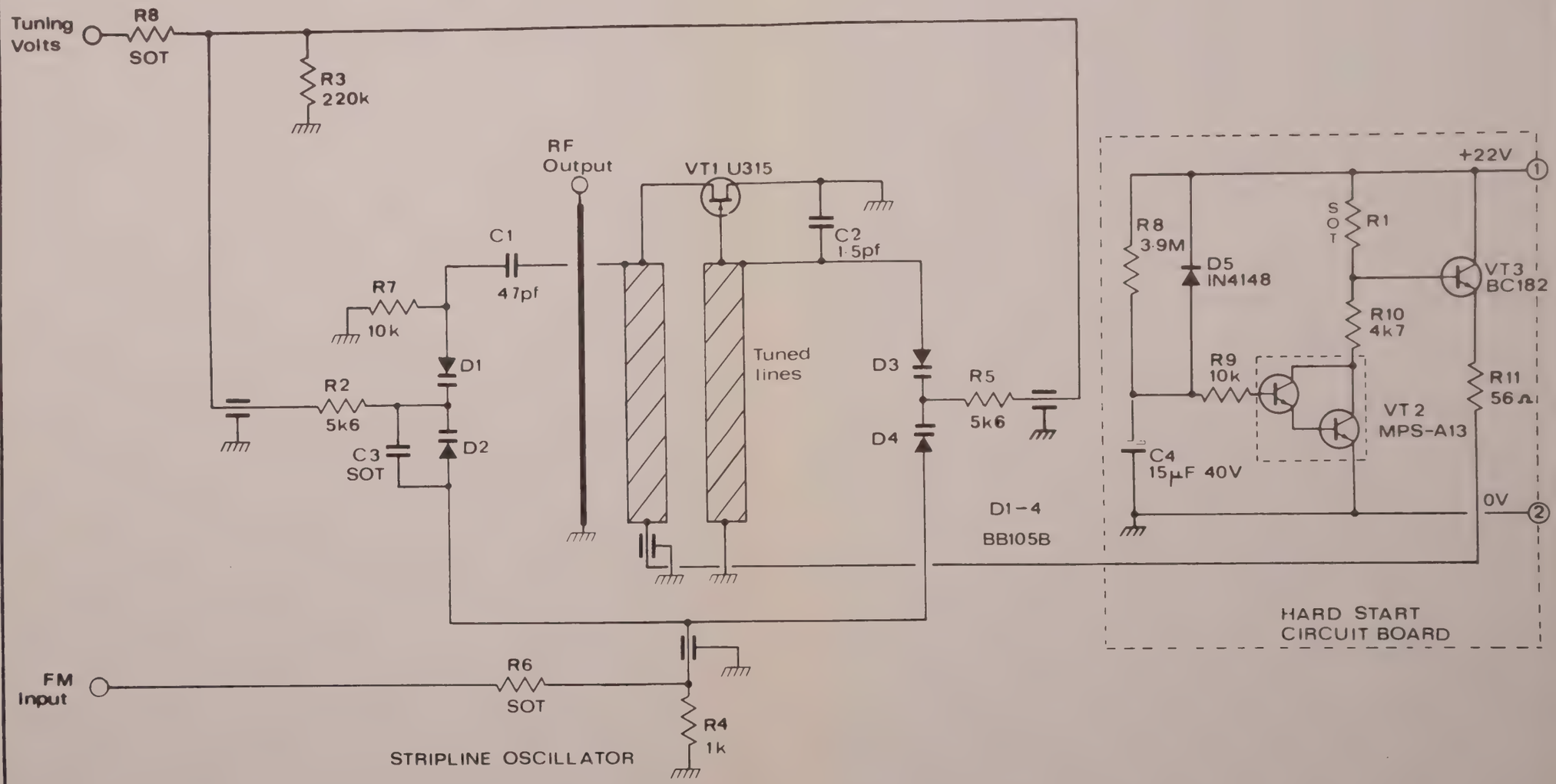
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R | 8 | 3 | 2 | 7 | 6 | 4 | 5 | 8 | 9 | 10 | 1 | 11 | R | | |
| C | 1 | 2 | 4 | 2 | 3 | | | | | | | | C | | |
| VT | 1 | | | | | | | | | | | | VT | | |
| MISC | D1,2 | D3,4 | D5 | | | | | | | | | | MISC | | |

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FARNELL INSTRUMENTS LTD. WETHERBY.

TITLE STRIP LINE OSCILLATOR SSG520

DRAWING No. 3SZ0832170 Section 3 issue 1 11·78

SHEET OF SHEETS

## THE FIRST ALC AMPLIFIER AND RANGE DECODER

### 1. *First ALC amplifier*

The r.f. output from the oscillator circuit board is fed to a two stage r.f. amplifier with an a.l.c. loop. This amplifier provides two important functions.

(i) Isolates the oscillators from the amplitude modulator thus avoiding frequency pulling

(ii) provides an adjustable levelled output for input variations of approximately 20dB range.

The d.c. output of the two Schottky detector diodes is fed to the inverted input of a high gain differential amplifier. The other amplifier input is referenced to a d.c. voltage adjusted by a preset potentiometer thus providing control of the output level. The output of the differential amplifier drives an emitter follower stage to provide current drive for the PIN diode. The loop is closed with a series PIN diode L section r.f. attenuator. Thus as the detected d.c. voltage increases (r.f. level increasing) the d.c. bias for the PIN diode is reduced, increasing the r.f. attenuation and maintaining the output level constant.

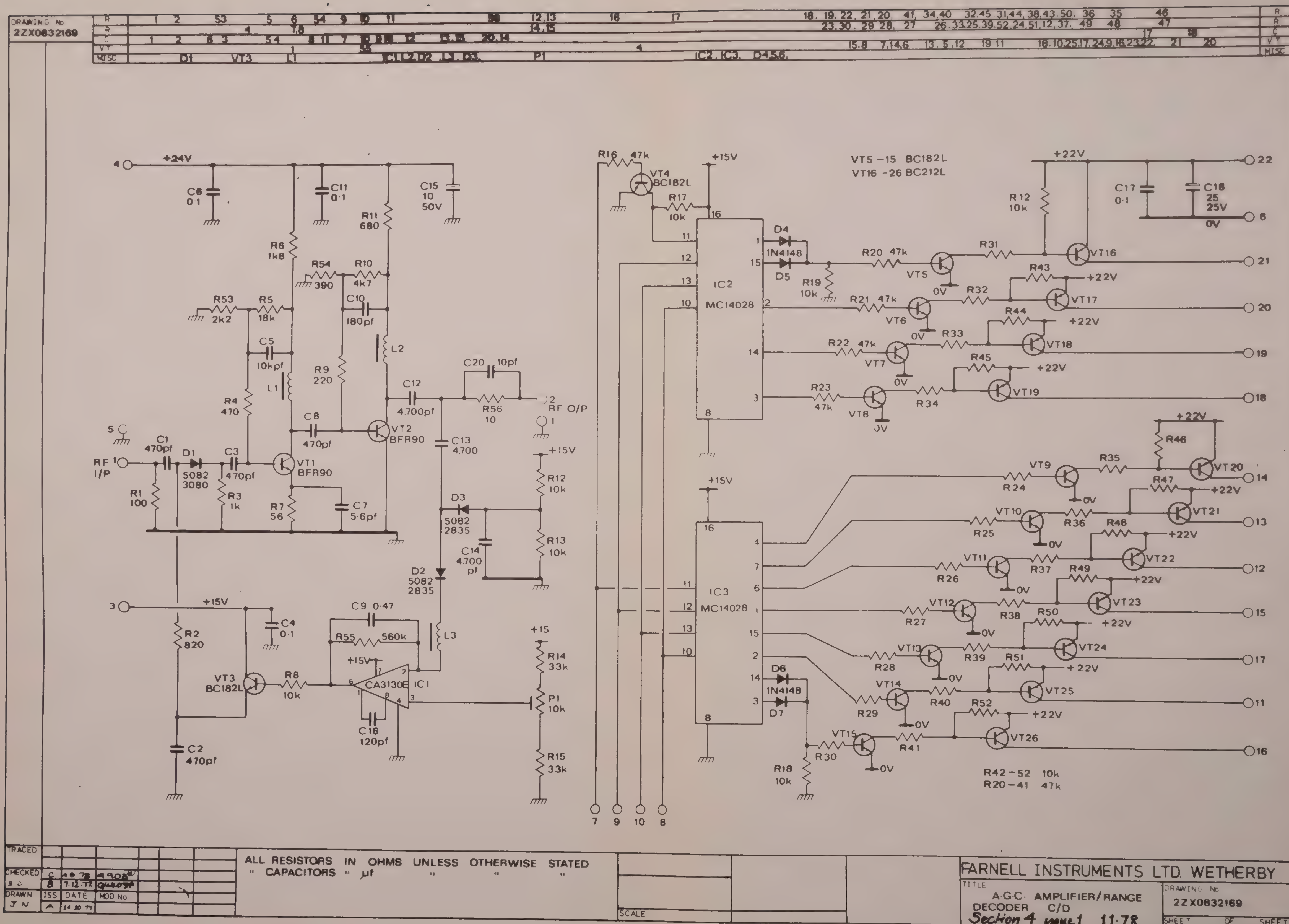
The loop response time is such that it will respond quickly to oscillator level changes with f.m. or sweep signals applied and so prevent the occurrence of amplitude pulling with frequency change.

The r.f. signal is fed to the amplitude modulator and prescaler buffer amplifier.

### 2. *Range decoder*

The range select data enters the r.f. box from the control board as four line binary to keep the number of feedthrough capacitors on the box lid to a minimum. Two b.c.d. to decimal converters wired in parallel are arranged to decode the thirteen binary input codes into one of eleven output lines. Input binary codes 0 and 1 drive range 1 and input binary codes 11 and 12 drive range 11. (The two extra range codes 0 and 12 are used as under and over range information on the range control board).

Each of the eleven output lines separately switches the 22V supply to one of the r.f. oscillators via two drive transistors.



DRAWING No 2ZX0832169
+24V
C6 0·1
C11 0·1
C15 10 50V
R11 680
R6 1k8
R54 390
R10 4k7
R53 2k2
R5 18k
C10 180pf
C5 10kpf
L1
L2
R9 220
R4 470
C12 4.700pf
C20 10pf
R56 10
RF O/P
C8 470pf
VT2 BFR90
C13 4.700
RF I/P
C1 470pf
D1 5082 3080
C3 470pf
VT1 BFR90
R1 100
R3 1k
R7 56
C7 5·6pf
+15V
R12 10k
D3 5082 2835
C14 4.700 pf
R13 10k
D2 5082 2835
C9 0·47
R55 560k
L3
C4 0·1
R2 820
VT3 BC182L
R8 10k
CA3130E IC1
C16 120pf
+15
R14 33k
P1 10k
R15 33k
C2 470pf
R16 47k
VT4 BC182L
R17 10k
IC2 MC14028
D4 1N4148 D5
R19 10k
VT5 –15 BC182L
VT16 –26 BC212L
+22V
R12 10k
C17 0·1
C18 25 25V
0V
R20 47k
R31
VT5
VT16
R43
R32
VT17
R21 47k
VT6
R44
R33
VT18
R22 47k
VT7
R45
R34
VT19
R23 47k
VT8
R46
VT20
VT9
R35
R24
R47
VT21
VT10
R36
R25
R48
VT22
VT11
R37
R26
R49
VT23
VT12
R38
R27
R50
VT24
VT13
R39
R28
R51
VT25
VT14
R40
R29
R52
VT26
VT15
R41
R30
IC3 MC14028
D6 1N4148 D7
R18 10k
R42–52 10k
R20–41 47k
ALL RESISTORS IN OHMS UNLESS OTHERWISE STATED
" CAPACITORS " μf " " "
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SCALE
FARNELL INSTRUMENTS LTD. WETHERBY
TITLE A.G.C. AMPLIFIER/RANGE DECODER C/D
Section 4 issue 1 11·78
DRAWING No 2ZX0832169
SHEET OF SHEETS

## THE AMPLITUDE MODULATOR AND ALC OUTPUT AMPLIFIER

### 1. *Amplitude modulator*

The signal from the 1st a.l.c. amplifier drives the amplitude modulator.

The amplitude modulator comprises a 'T' section r.f. attenuator using PIN diodes, thus enabling the attenuation to be controlled by the d.c. bias current to the diodes.

The series PIN diodes have adjustable d.c. bias to set the insertion loss of the modulator, while the shunt diode has an essentially fixed bias with a very fine adjustment for setting the modulation distortion. Amplitude modulation is achieved by superimposing an audio signal on to the static d.c. bias of the PIN diodes. On the positive going cycle of the audio modulating signal the bias current to the series PIN diodes is increased, but reduced to the shunt diode (vice versa for the negative cycle).

PIN diodes have a slightly non-linear current versus r.f. resistance characteristic. By using a 'T' attenuator with the same static bias current as the series and shunt diodes, the modulation signal, when applied to the shunt diode, tends to cancel out the non-linearity of the series diodes. The modulation distortion potentiometer provides slight adjustment of the shunt diode current so that the shunt-series diode laws may be matched.

The r.f. is then routed to the output amplifier via a circuit board link.

### 2. *A.L.C. output amplifier*

The r.f. output from the modulator is fed to a three stage wideband r.f. amplifier with an a.l.c. loop. Three stages of gain are required to make up the amplitude modulator insertion loss and enable a maximum r.f. output capability of at least +6dBm. This ensures maximum modulation depth capability with minimal additional distortion.

The d.c. output from the Schottky detector diodes is fed to the inverting input of a high gain differential amplifier. The non-inverting input is referenced to a d.c. level. This d.c. level is obtained from the control board and is varied by the r.f. level control and 1dB step attenuator switch. The output of the differential amplifier drives an emitter follower stage to provide current drive for the PIN diode.

The loop is closed with a series PIN diode 'L' section r.f. attenuator. Thus as the detected d.c. voltage increases (r.f. level increasing) the d.c. bias for the PIN diode is reduced and the r.f. level attenuated more.

The detector stage has Schottky diodes in the d.c. bias line to compensate for temperature variations. This ensures the r.f. output amplitude does not change appreciably with temperature.

The a.l.c. loop time constant must be large compared to 50mS (20Hz) so that the loop does not remove or distort the amplitude modulation at 20Hz modulation frequency. A low pass filter in the output of the differential amplifier ensures this.

After the output amplifier the r.f. signal is passed to the 10dB step attenuator.

## THE OUTPUT ATTENUATOR

The output amplifier is fed to the coarse step attenuator. This comprises a 10dB, 20dB and two 40dB sections switched in with r.f. relays thus giving a range of -10dB to 110dB. The attenuators are Pi section resistor networks with a characteristic impedance of 50Ω. Small impedance matching capacitors are required progressively along the attenuator to compensate for the slight inductance of the relay leads.

The relay cans are retained in the attenuator frame by screw rings enabling replacement in the event of damage. The screw thread also provides good r.f. sealing.

Single Pi section feedthrough capacitors are used on the supply rail to the 10 and 20dB sections but two stages of feed-through capacitors are necessary for r.f. screening on the 40dB section. The 40dB sections also have copper foil soldered over the attenuator box to prevent cross-talk along the attenuator length.

Two relays are employed for each 40dB section with only one half of each relay being used. This eliminates r.f. cross-talk between relay contacts inside the relay can.

Attenuator sections are connected by lengths of 40Ω solid coaxial tube. Input and output coax connections are in the same material to keep r.f. radiation down.

The attenuator output is connected to the instrument r.f. output socket.

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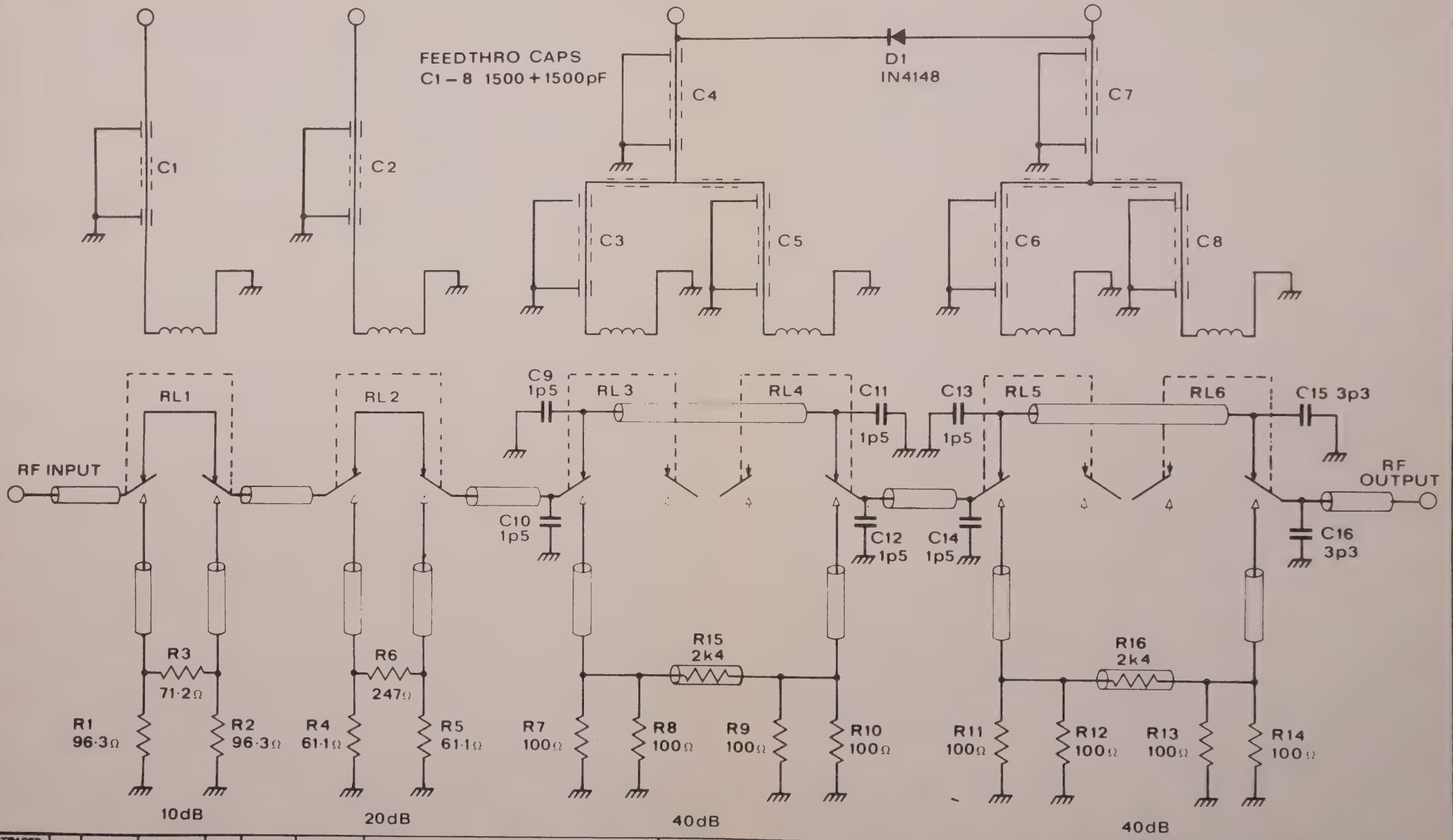


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832

NOTES

FARNELL INSTRUMENTS LTD. WETHERBY, YORKS.

TITLE:
10dB STEP ATTENUATOR
SSG 520 *Section 6 issue 1 11-78*

DRAWING NO.
3ZX0832171

SHEET 1 OF 1 SHEETS

## THE PRESCALER AND PRESCALER BUFFER AMPLIFIER

### 1. *Buffer amplifier*

The r.f. output from the first a.l.c. amplifier is fed to a two stage r.f. amplifier with a.l.c. loop. This amplifier provides two important functions.

(i) Isolates the r.f. chain from the prescaler, reducing feedback of logic spikes,

(ii) provides an adjustable levelled r.f. output. This controllable level output is essential to ensure that the e.c.l. prescaler logic following is correctly toggled.

The d.c. output of the Schottky detector diodes is fed to the inverting input of a high gain differential amplifier. The non-inverting input is referenced to a d.c. voltage (adjusted by a preset potentiometer) thus providing control of the output level. The output of the differential amplifier drives an emitter follower stage to provide current drive for the PIN diode.

The loop is closed by a series PIN diode 'L' section r.f. attenuator.

The buffer amplifier output is fed to the prescaler circuit via a circuit board link.

### 2. *Prescaler*

This is a direct counting, two decade, asynchronously set type of prescaler. It works by removing a preset number of pulses from the synthesizer programmable divider chain, the preset number being set by the thumbwheels. These pulses are removed sometime during the clock period of the divider chain. In the following description, figures shown thus (1) refer to the timing diagram sequence.

a) Assume the initial conditions of both divide 10/11 counters IC2 and 7 being in the ÷10 mode, that is one or more of the E inputs being hi.

b) The LOAD pulse is a lo going hi (from the divider chain circuitry). On the rising edge (1) the Q1 output of IC6 goes hi (2) and is latched there independent of further load pulse transitions. Assume that this load pulse is asynchronous with any pulses on the prescaler board.

c) The output is the DATA input of another flip flop. On the next clock output rising edge (3) , IC7 pin 7, the DATA is transferred to the Q2 output of IC6 (4) .

d) This Q2 output holds the E5 input of IC7 hi so that it still divides by 10.

e) The Q2 output of IC6 loads the divide by a counter, IC8, with the thumbwheel information, in this case the counter is loaded to 1 so the max/min output of this counter goes lo (6) . This enables the counter and takes the E4 input of IC2 lo (but the E5 input is still hi) but the counter does not count because the load pulse is overriding any clock pulses. The $\overline{Q2}$ output of IC6 also resets the Q1 output of IC6 to lo (7) ready for the next LOAD pulse when the sequence would start again.

f) The Q2 output of IC6 is also the DATA input of IC5. On the next rising edge of the Q4 output of IC2 the Q2 output of IC5 goes hi (8) . This holds the E1 input of IC2 hi and also takes the output of the 5 input NOR gate lo (10) which is the S2 input of IC3 and the E2 input of IC2.

g) The Q2 output of IC5 goes lo (9) which is the S1 input of IC3.

h) The next rising edge of the Q4 output of IC2 loads the ÷n counter, IC3, with the thumbwheel information, in this case the counter is loaded to 2, so the decoded outputs feeding into the 5 input NOR gate change to the loaded-in information.

i) When the clock output next rises (11) the Q2 output of IC6 changes to lo (12) because the data changed at note (e) to lo, this removes the hi on the E5 input of IC7, so that IC7 next time round would divide by 11. The data input of IC5 is now lo.

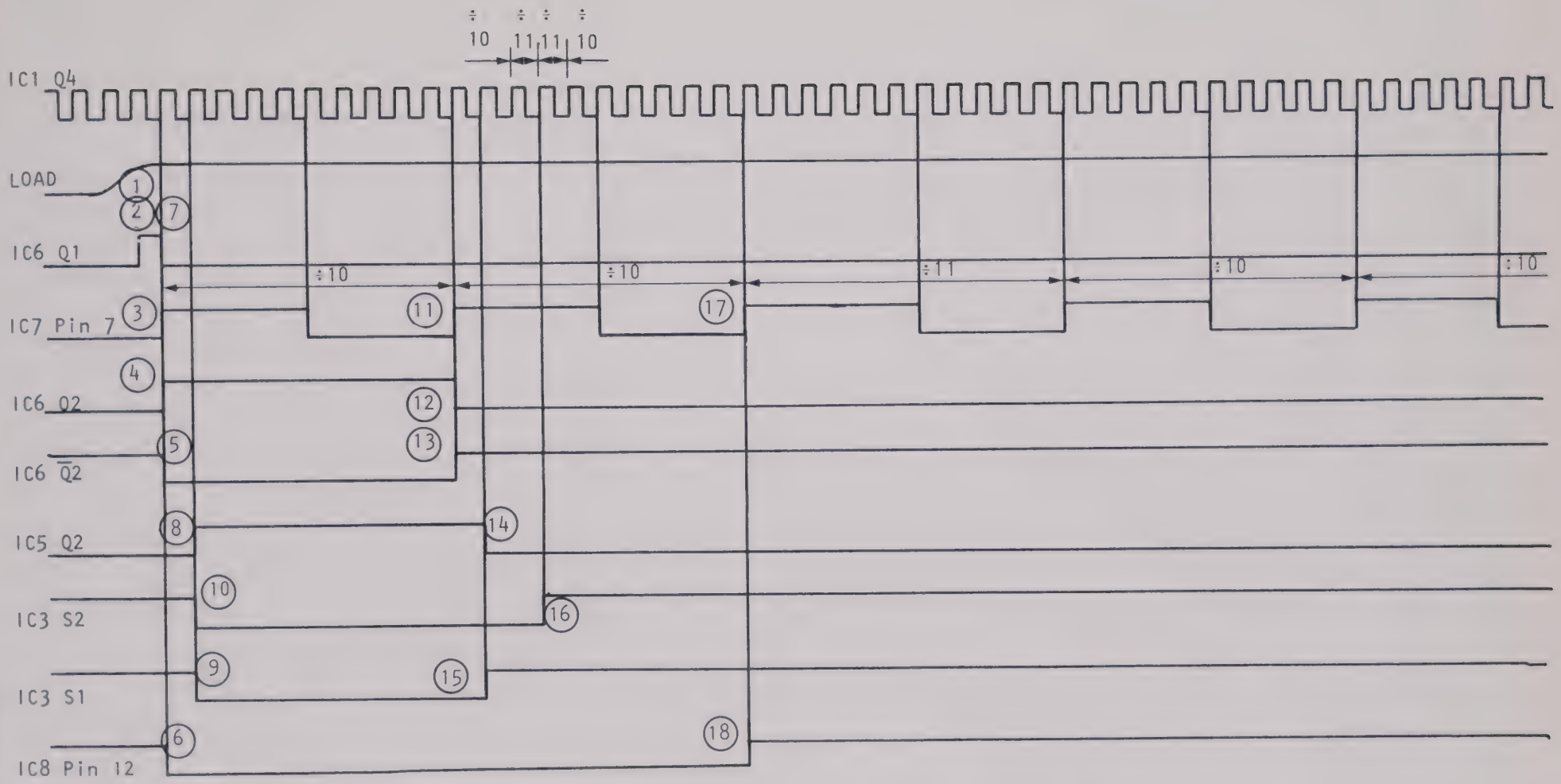
Also the load pulse of IC8 is removed (13) and IC8 can now count down on subsequent clock pulses.

j) The next rising edge of the Q4 output of IC2 changes the Q2 output of IC5 to lo (14) and so the E1 input of IC2 is also lo, so IC2 next time round would divide by 11.

k) The $\overline{Q2}$ output of IC5 and thus the S1 input of IC3 goes hi (15) thus IC3 is enabled to count down.

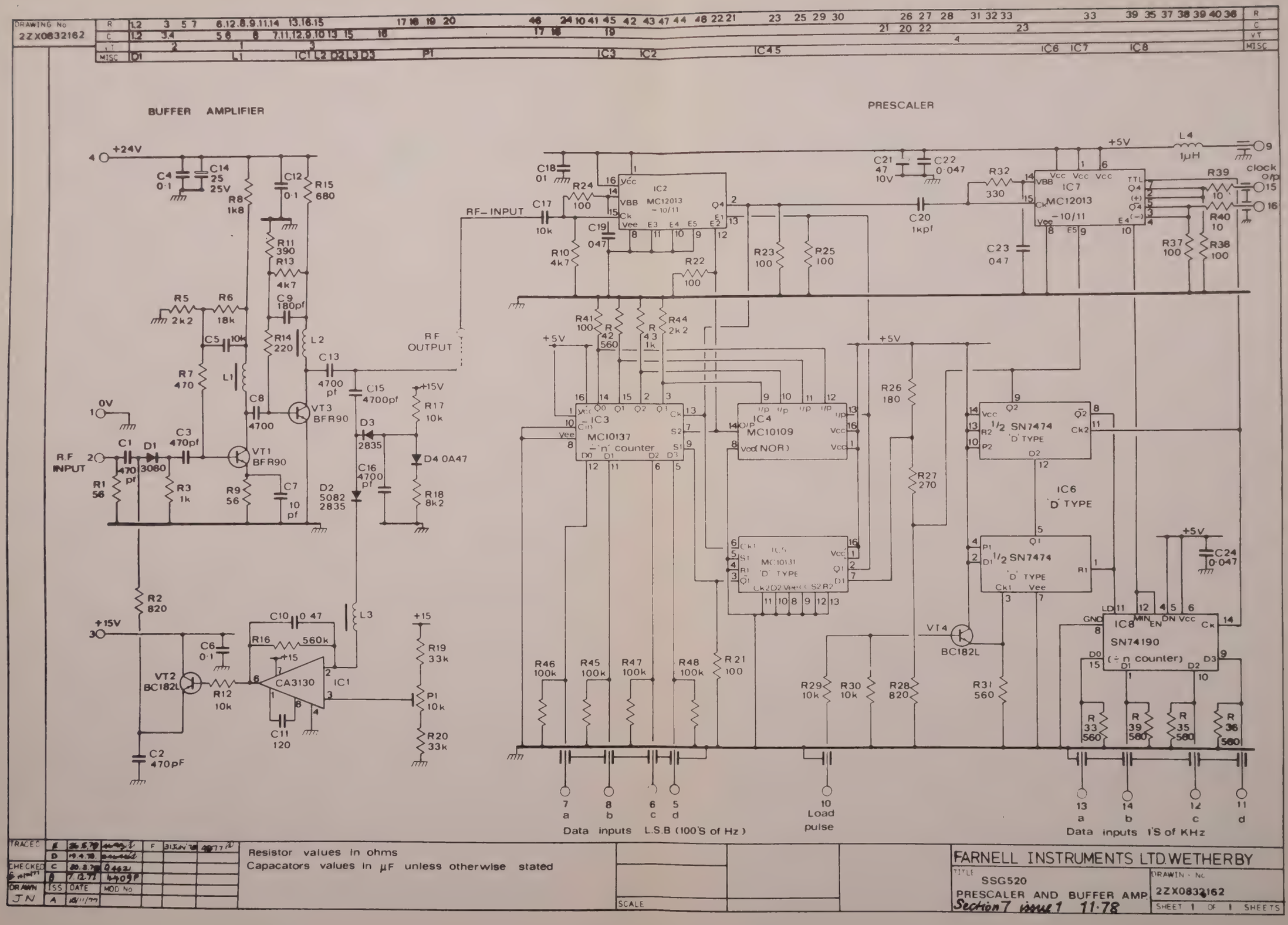
l) The next two rising edges of the Q4 output of IC2 decrement the counter IC3 to zero so that the output of the 5 input NOR gate, the S2 input of IC3 and the E2 input of IC2 goes hi (16) . This has the effect of inhibiting IC3 so the circuit remains latched in this position until another LOAD pulse arrives, and telling IC2 to divide by 10 after the completion of the last ÷ by 11 (having divided by 11 once previously).

m) When the clock output next rises (17) IC8 decrements to zero so that its max/min goes hi (18) . This disables the counter and takes the E4 input of IC2 hi so that after completing the ÷ 11 count IC2 will continue on to divide by 10 and the whole system remains static in this mode until the next LOAD pulse.




PRESCALER TIMING DIAGRAM

LSB (100Hz) loaded to 2
Next SB (kHz) loaded to 1


DRAWING No 2ZX0832162
BUFFER AMPLIFIER
PRESCALER
+24V
RF INPUT
RF OUTPUT
0V
+15V
+5V
IC1 CA3130
IC2 MC12013 -10/11
IC3 MC10137 ÷n counter
IC4 MC10109 (NOR)
IC5 MC10131 'D' TYPE
IC6 'D' TYPE
½ SN7474 'D' TYPE
IC7 MC12013 -10/11
IC8 SN74190 (÷n counter)
VT1 BFR90
VT2 BC182L
VT3 BFR90
VT4 BC182L
L1
L2
L3
L4 1µH
clock o/p
Data inputs L.S.B (100'S of Hz)
Load pulse
Data inputs 1'S of KHz
Resistor values in ohms
Capacators values in µF unless otherwise stated
FARNELL INSTRUMENTS LTD. WETHERBY
SSG520
PRESCALER AND BUFFER AMP.
Section 7 issue 1 11·78
2ZX0832162

## THE R.F. BOX EXTERNAL AND INTERNAL WIRING

The r.f. box is fitted with capacitive feedthroughs on all connections except the main coaxial r.f. output. These feedthroughs are arranged in a double filtering system with two separate sets of gaskets to ensure maximum r.f. screening.

All instrument earth wires are taken to tags on the r.f. box and this is the only chassis member designed to carry current.

Inside the r.f. box the high frequency earth continuity is of paramount importance so all r.f. boards are directly earthed to the chassis with coaxial leads linking the circuit functions. The range decode/select logic section is not earthed in this way as it carries no r.f. but has a separate earth wire taken back to the common earth tag in the stripline oscillator.

The majority of wiring for the circuits on one side of the r.f. box is taken to the feedthrough capacitors on the same side. The few connections that do pass between r.f. box upper and lower sides are taken via capacitive feedthroughs in the centre plate, or via coaxial cable.

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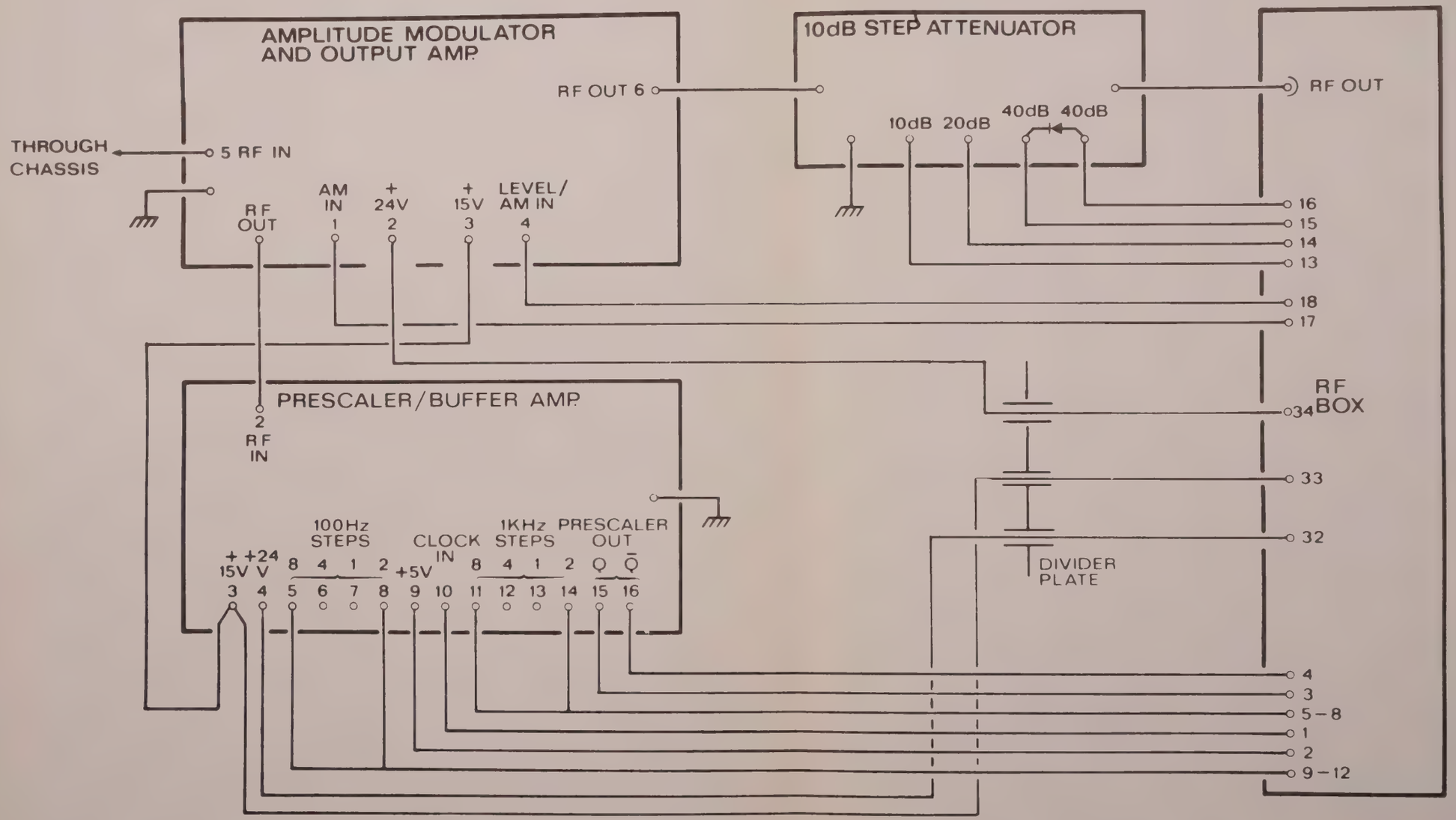


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SSG RF BOX (UPPER SECTION)
WIRING

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3ZV0832279
Section 8 issue 1 11-78

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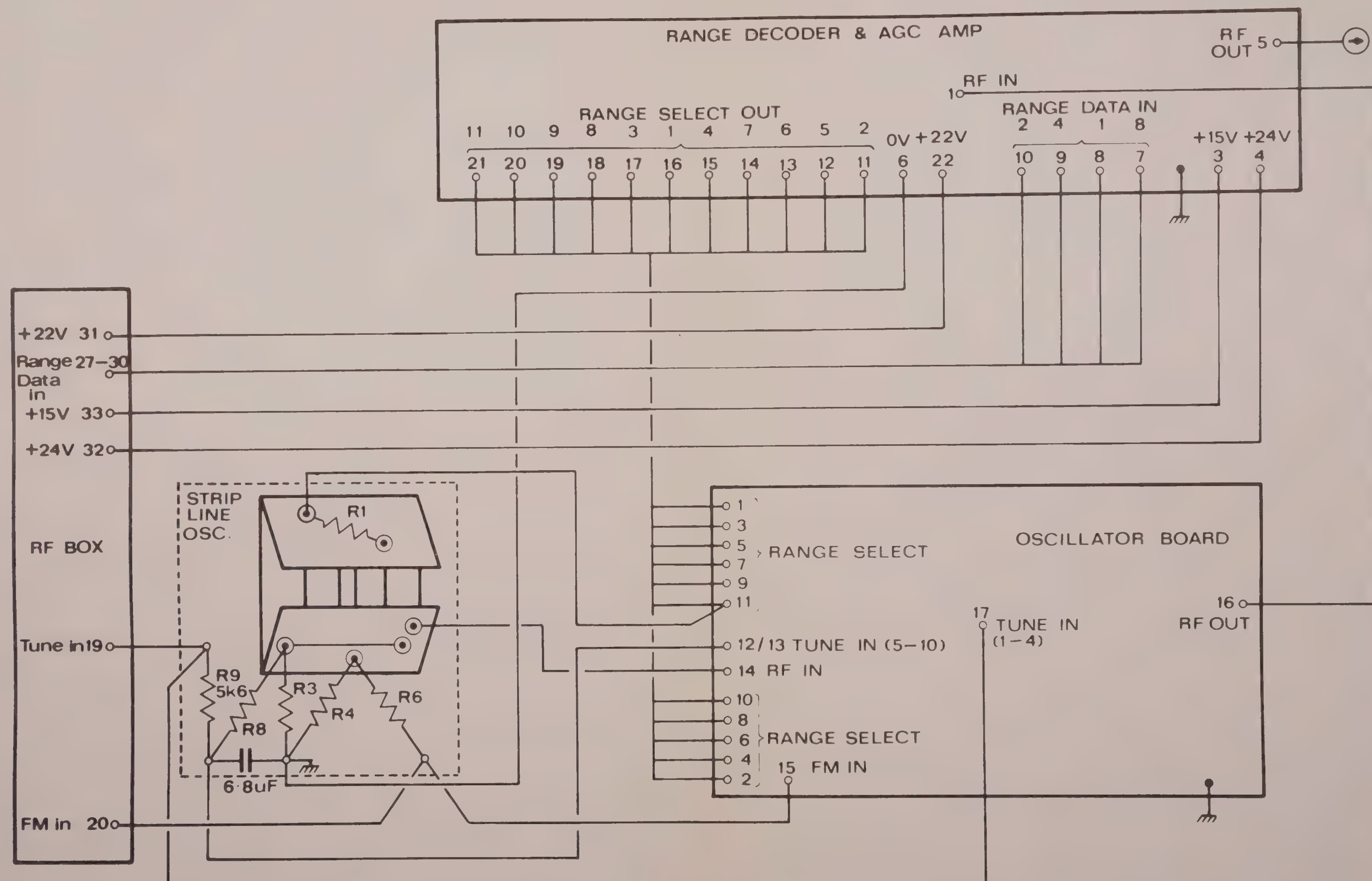


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RF BOX (LOWER SECTION)
WIRING SSG520

DRAWING No
3ZV0832270
*Section 8 issue 1 11·78*

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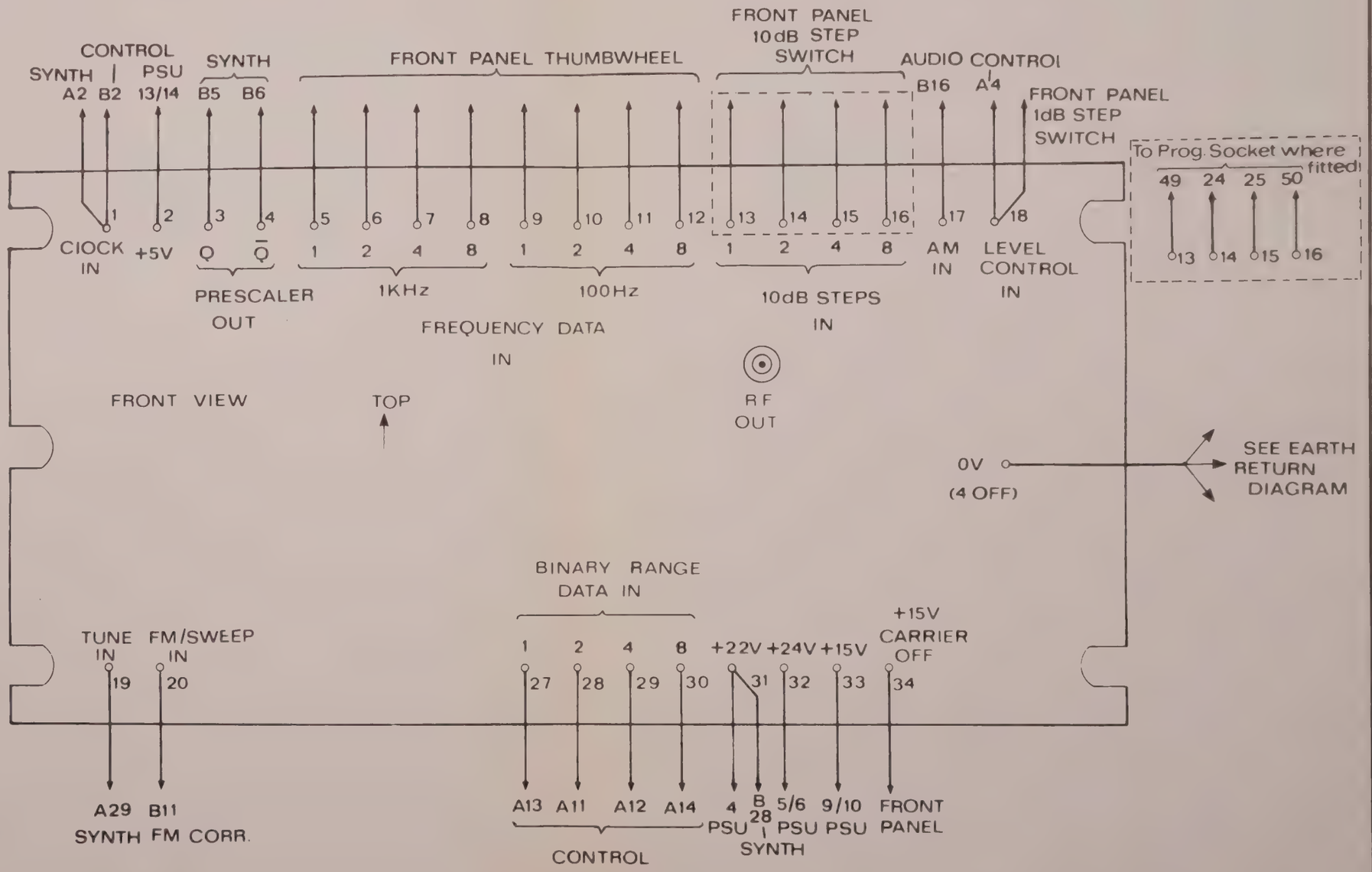


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NOTE

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TITLE
RF BOX WIRING
SSG520

DRAWING No
3ZV0832274
Section 8 issue 1 11-78

## THE RANGE CONTROL AND OUTPUT LEVEL BOARD

### *1. Range control*

The control board sends information to energise the appropriate r.f. oscillator for any selected frequency within the coverage 10 to 520MHz as selected either by the thumbwheel switches or an external programme (if fitted). The range information is coded in four line binary and fed to the r.f. box where it is decoded into individual lines to drive the selected oscillator.

The thumbwheel switch information of the megahertz, tens and hundreds of megahertz digits is taken in b.c.d. form to the 'A' inputs of three digital comparators IC7, IC8 and IC9 connected in series. The lower range limit of each oscillator is then applied successively to the 'B' inputs, again in b.c.d. form. A binary down counter, IC4, is clocked continuously by the 100Hz clock pulse. The counter's a, b, c and d outputs go to the data inputs of a four bit data latch, IC3, which transfers data from its inputs to its Q outputs when its clock input is low. (Its clock input is normally high). The counter's outputs also go to IC1 and IC2 which together decode the binary information into hexadecimal (sixteen lines).

NOTE: Qo of IC2 = 0, Q1 = 1, Q2 = 2 ..... Q7 = 7 then Qo of IC1 = 8
Q1 of IC1 = 9, Q2 = 10, Q3 = 11 .... Q7 = 15

As the counter counts down from 15 to 0 each of the sixteen decoded lines in turn goes high. Some of these lines are connected to the 'B' inputs of the digital comparators via diodes so that the data inputs have the lower limit of the oscillator one range higher than the counter applied to them in b.c.d. form. For example:-

If the counter is on range four its d, c, b and a outputs are 0, 1, 0, 0 respectively and the Q4 output of IC2 is high. This output (Q4) has diodes connected to the 'c' input of the tens of MHz comparator, IC8 and the 'c' and 'a' inputs of the MHz comparator, IC9. The number applied to the comparator's 'B' inputs therefore is 45 which is the lower limit of range 5.

The next 100Hz clock pulse decrements the counter to range 3 where its outputs are 0, 0, 1, 1, which energises the Q3 output of IC2 which applies 33 (range 4 lower limit) to the comparator by pulling the 'b' and 'a' inputs of both the MHz and tens of MHz comparator high.

As the counter is clocked, the lower limits of the oscillator ranges are applied one after another to the comparators. The A<B output of the comparators remains high as long as the 'A' input is lower than or equal to the 'B' input. (In our case the A input is the thumbwheel switch information and the B input is the oscillator lower range points). As soon as a lower range limit less than the thumbwheel switch setting is applied to the 'B' input the A<B output goes low. This falling edge is used to trigger a monostable, the output of which is connected to clock the 4 bit latch, IC3. The outputs of the counter are clocked through the latch at this time to operate the appropriate oscillator range. Since a clock pulse only occurs every time the A<B output of the comparator goes low, the latch only lets through the one range immediately below the thumbwheel setting.

The counter is being continually clocked round so that if the thumbwheel information is changed the trigger occurs at the appropriate range.

NOTE: Range 13 is applied to the 'B' input of the hundreds of MHz comparator by taking the 'd' and 'c' input high. This is a number which is far higher than the thumbwheel switches can go. This ensures that the A<B output always goes high at some point so that the falling edge can trigger the monostable.

*Out of range indication*

When frequencies above 520MHz are selected range 12 is the one decoded. Gates consisting of IC6b and part of IC5 decode range 12 and change the binary information applied to the outputs to range 11 at the same time activating the 'overrange output and the 'out of range' output. Similarly, when the frequencies below MHz are selected range 0 is decoded. IC6a decodes this and changes the output information to range 1, at the same time activating the 'under range' and 'out of range' outputs.

*Manual operation*

When the Auto/Man. switch (provided for test purposes) is set to Man. the preset enable of the counter forces the counter outputs to be the same as the preset inputs which are selected by the data switches. The monostable output is forced low, by the diode D53 forcing the inverting buffer input high, so the latch outputs follow its data inputs which in turn follow the preset inputs of the counter. The counter clock has no effect at this time because the preset enable overrides the clock.

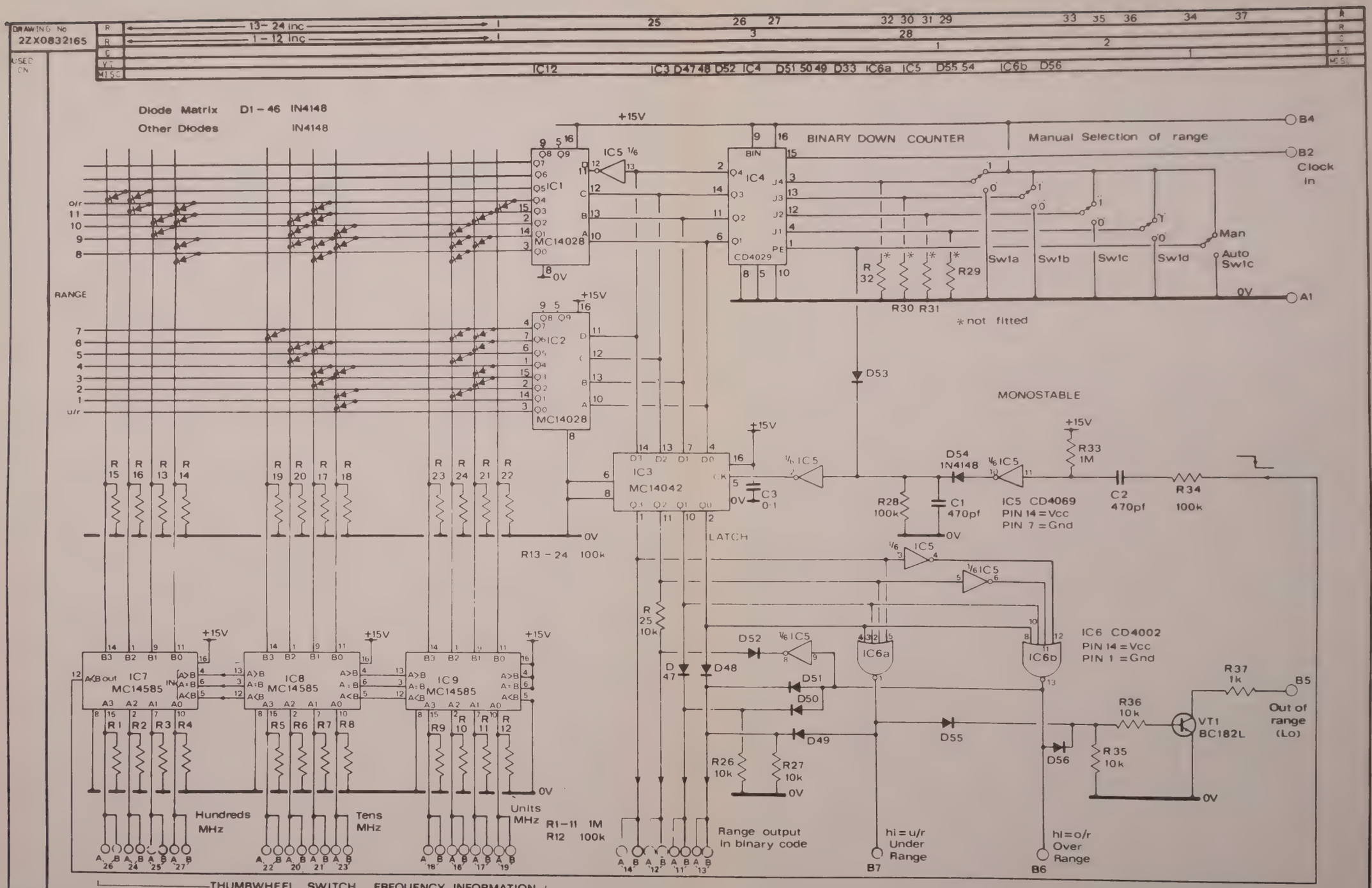
*The monostable*

Because the different range change points are applied to the comparator's 'B' inputs via diodes which are passively pulled down it is possible for some 'B' information to overlap thereby momentarily applying a much higher 'B' number than is actually required. This causes a spike on the A<B output for the duration of the overlap when in fact A is supposed to be greater than B. The falling edge of this spike, or spikes, will trigger the monostable and cause a series of wrong range selections. To eliminate this problem the trigger input of the monostable is connected to the A<B output via a 100K resistor. Normally the input capacitor, C2, is charged up by the A<B output being high so that when it goes low both sides of the capacitor go low until the capacitor charges via R33. When the A<B line goes high again the capacitor discharges via R34 and an internal diode on the gate input which is not shown on the diagram. If the A<B line does not stay high long enough to discharge the capacitor, as in the case of a spike, then the falling edge cannot trigger the monostable, so R34 is made large enough to stop a spike discharging C2 and small enough compared to R33 not to pot down the amplitude of the trigger pulse.

*2. Output level*

This circuit provides the d.c. reference for the r.f. output amplifier a.l.c. It further modifies this level in logarithmic steps to provide the 1dB output level steps. A summing amplifier has two d.c. sources, one of which calibrates the output level, the other is variable allowing a vernier control of level. The amplifier output before passing to the 1dB step switch, drives the output level meter. Diode temperature compensation is provided for the 1dB step attenuator.

The reference line also has an input from the audio board which compensates the output level as amplitude modulation is applied thus maintaining constant average r.f. output level.




Resistors in ohms
Capacitors in μF unless otherwise stated
OB5 Refers to the circuit board edge connector side A or side B and number

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TITLE: CONTROL BOARD SSG520
Section 9 issue 1 11·78

DRAWING No 2ZX0832165

SHEET 1 OF 2 SHEETS

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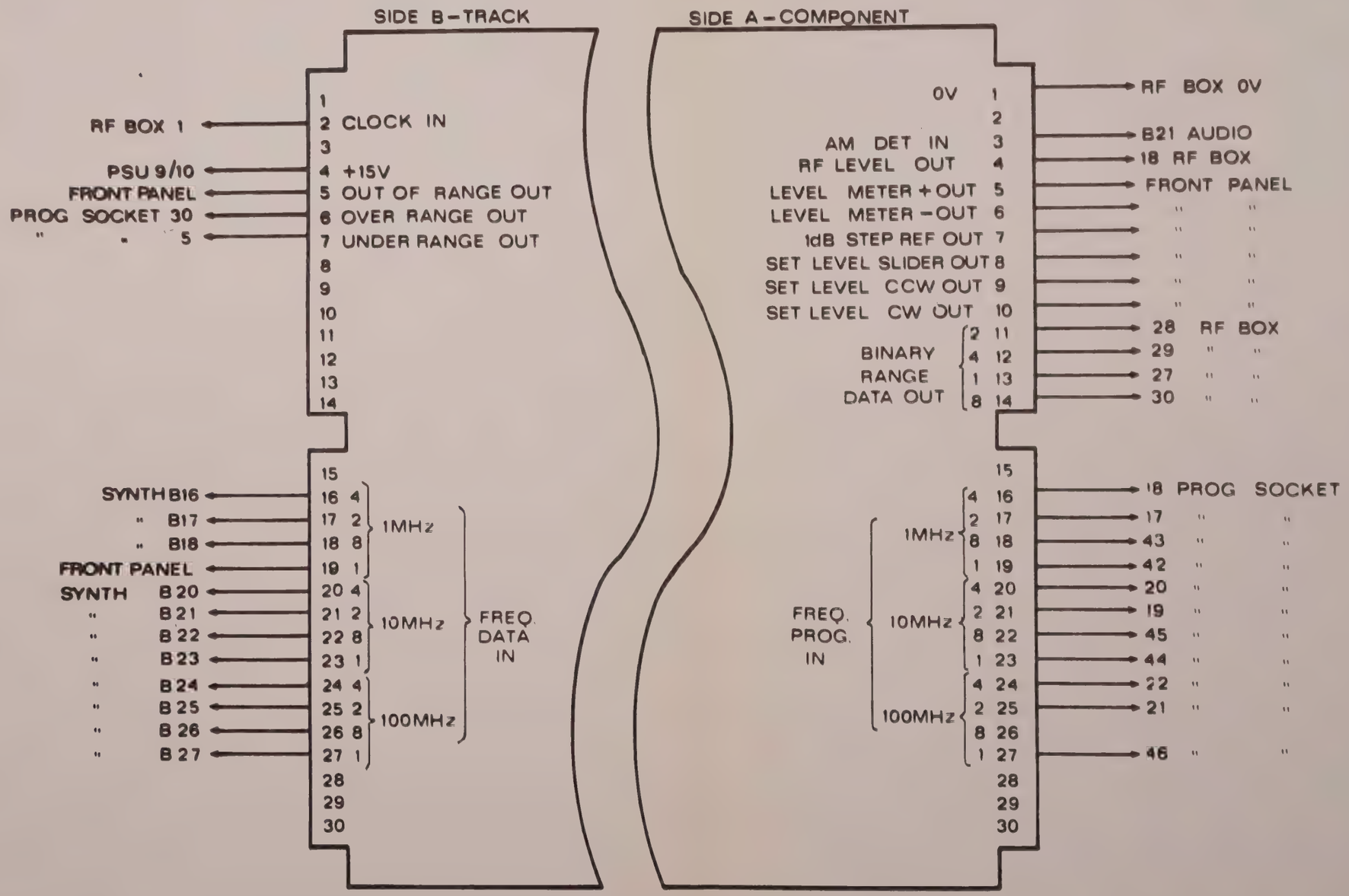


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NOTES

FARNELL INSTRUMENTS LTD WETHERBY.

TITLE
CONTROL BOARD WIRING
SSG520

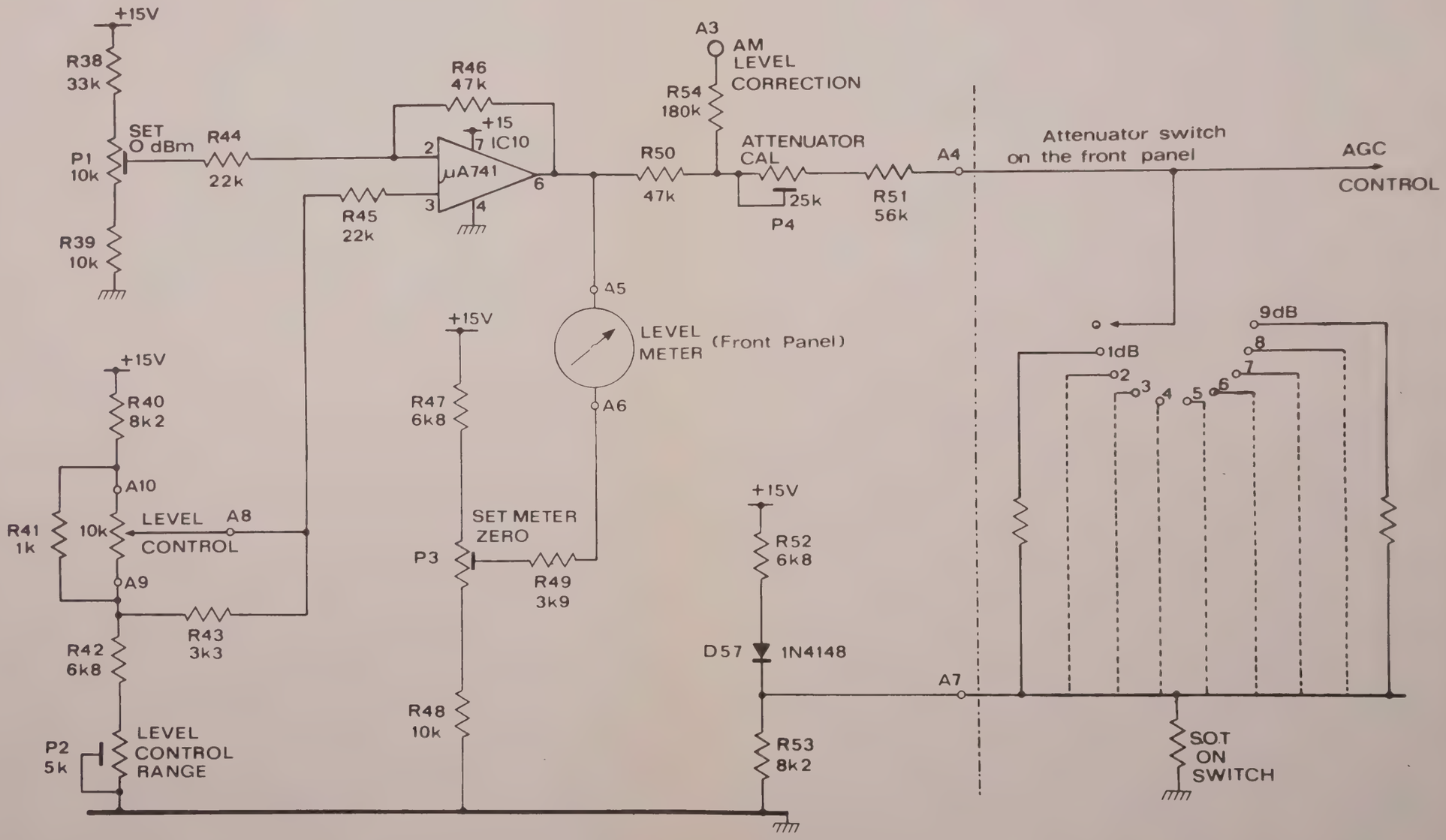
DRAWING No
3ZV0832271
Section 9 issue 1 11·78

DRAWING No. 3ZX0832165

| | |
|---|---|
| R | 41,38,39,40,42,43,44 45 46,47,48,49, 50 54 52,53 51 |
| C | |
| VT | |
| Misc | P1,2 P3 IC10 D57 |

USED ON

## R.F OUTPUT LEVEL CONTROL

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Resistor values in ohms

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TITLE CONTROL BOARD SSG520 Section 9 issue 1 11-7

DRAWING No 3ZX0832165

SHEET 2 OF 2 SHEETS

## THE SYNTHESIZER BOARD

The purpose of the synthesizer is to provide a d.c. voltage of an amplitude suitable to drive the voltage controlled varactor oscillators to the frequency set up on the thumbwheel switches (provided this is within the oscillator range). It does this by monitoring a sub multiple (in this case 1/100th) of the oscillator frequency and by comparing it to a crystal reference frequency it uses any difference between the two to correct for frequency/ phase errors. The synthesizer can be divided into four sections: Programmable divider, reference divider, frequency/ phase detector and integrator.

### 1. THE PROGRAMMABLE DIVIDER

This is a chain of five programmable b.c.d. down counters. A programmable counter is one where its outputs can be set to the same states as its programme inputs by application of a pulse to its 'load' input. If the programme inputs of a counter are set to 5 (coded in b.c.d.) and a load pulse is applied, the counter outputs will go to 5. If the load pulse is removed and the counter is clocked down, the outputs will go from 5 to 4, 3, 2, 1, 0, 9, 8, 7 etc. When a number of counters are connected in series the succeeding one is clocked once every time the preceding one goes from 0 to 9.

If three counters are connected in series and loaded together to 5, 3 and 2, where the least significant one is 5 and the most significant one is 2, then the first counter will count from 5 to 4, then 3, 2, 1, 0 and 9 and will continue dividing. The second counter will go from 3 to 2 when the first one has reached the 0 to 9 transition for the first time, from 2 to 1 on the second time around, from 1 to 0 the third time around and from 0 to 9 the next time around when it will also clock the third counter from 2 to 1 etc.

In this example, to count the most significant bit (m.s.b.) counter to zero took 136 pulses made up as follows:-

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | to | | take | the | 1st | counter | to | 9 | which | took | the | second | counter | to 2 |
| 10 | more | to | " | " | " | " | " | 9 | again | " | " | " | " | " 1 |
| 10 | " | " | " | " | " | " | " | 9 | " | " | " | " | " | " 0 |
| 10 | " | " | " | " | " | " | " | 9 | " | " | " | " | " | " 9* |

*This took the m.s.b. counter to 1 but the others are at 99. To count the m.s.b. counter to 0 means that the others have to go to 99 again which is a total of 100 more pulses.

The total number of pulses to count the m.s.b. counter to zero
= 6 + 10 + 10 + 10 + 100
= 136 pulses.

The other counters at this time are at 99, so to count them to zero takes a further 99 pulses. The total number of pulses required to count all of the counters to zero therefore is 136 pulses + 99 pulses = 235 pulses.

The outputs of the counters are detected for all of them being at zero and this information is used to re-load them. A load pulse then occurs every 235 input pulses. The load pulse is 1/235th of the input frequency, conversely the input frequency is the number set up on the preset inputs (the division ratio) times the load pulse frequency.

In a synthesizer the circuit is designed so that the input frequency is adjusted so that the load pulse frequency is the same as a reference frequency, hence the input frequency = the divider chain division ratio x ref. frequency.

The reference frequency in the SSG520 is chosen as 100Hz and there are five dividers the preset inputs of which are connected to the first five significant thumbwheel switches.

The maximum frequency of the synthesizer input is just in excess of 5MHz (when the thumbwheels are set to 5XXXX which means 5XXXX x 100Hz = 5.XXXXMHz). Because the synthesizer input frequency is 1/100th the oscillator frequency is 5XX.XXMHz and the resolution is 10kHz.

*Prescaling (See prescaler section)*

The division of the oscillator frequency by 100 is known as prescaling and is done because programmable counters tend to be fairly slow devices and cannot work at the high oscillator frequencies encountered in the SSG520. On the other hand : by 10 or 11 counters as used in the prescaler are capable of operating at frequencies up to 550MHz. The straight division by 100 in a prescaler results in a loss of resolution (to maintain higher resolution

requires lower reference frequencies which means longer settling times). The prescaler in the SSG520 is uniquely designed to divide by other than a straight 100 and so achieves another two digits of resolution i.e. 1kHz and 100Hz.

*Look-ahead*

To detect the zero of the counters the 'carry out' terminals of all but the first counter are taken to IC10, a NOR gate. The a, b, c, d outputs of the first counter IC13 are taken via part of IC10 and part of IC12 to the data input of ½IC11, a 'd-type' flip flop, to decode not zero but count 2. This is known as look-ahead and is used to permit faster loading and operation of the counters.

In a non look-ahead system a counter has to count down to zero, have the zero detected, feed the load pulse to the load inputs and remove the load pulse prior to the next clock pulse. The time taken to do all this, observing minimum set-up and release times, must be less than the period of the fastest clock pulse. For the SSG520 these propagation delay times exceed the period of the highest required clock frequency, so a look-ahead system is used.

With a look-ahead system the re-loading procedure is stretched out over a number of clock pulses and reduces the effect of propagation delay times.

Normally the data input of the 'd-type' flip flop, IC11, is high until the outputs of IC14, 15, 16 and 17 are low and the clock pulse occurs to change the output of IC13 from 3 to 2, whereupon the data input goes low but the outputs of the 'd-type' remain unchanged because the clock pulse has already gone. When the next clock pulse comes along the data input is still low so the $\overline{Q}$ output of the flip flop goes high and loads the counters. This removes the low from the data input but is too late to change the $\overline{Q}$ output back, which remains high. The counters are unable to respond to the clock pulse since the load pulse is overriding it. The counters at this time would normally have counted to 1. The next clock pulse removes the load pulse from the counters but since its removal occurs slightly after the clock pulse the counters remain in their loaded state. The counters at this time would normally have counted to 0. The next clock pulse decrements the counters from the loaded information as normal. The advantage of this system is that the counters receive a load pulse the period of one complete

input cycle and propagation delays are reduced to that of the 'd-type' clock/output which are much faster than a programmable counter.

*Clock input*

The output from the prescaler is at emitter coupled logic levels and is in the form of a differential signal to improve noise immunity. These are fed to a differential transistor amplifier the output of which is further amplified to cos/mos level by a cos/mos gate acting as a linear amplifier. The signal goes through another gate of which the other input is available for inhibiting clock pulses when it is taken low.

## 2. THE REFERENCE DIVIDER

The reference frequency of the synthesizer as mentioned is 100Hz but an industry standard of 2MHz exists. The reference is divided down by IC6, 7, 8 and 9 to 200Hz and down to 100Hz by ½IC11, a 'd-type' flip flop connected to divide by 2.

## 3. THE FREQUENCY/PHASE DETECTOR

The inputs to the frequency/phase detector are the reference 100Hz and the load pulse. The output of the detector consists of two lines from pins 9 and 6 of IC2. If the load pulse frequency is higher than the reference frequency, pulses come out of pin 6 and pin 9 remains high. If the load pulse frequency is lower than the reference frequency pulses come out of pin 9 and pin 6 remains high. As the frequencies become the same, the width of pulse is proportional to the phase error between them. Provision is made to disable the pulses from progressing to the integrator. Note that the pulses from pin 6 are inverted before being applied to the integrator.

## 4. THE INTEGRATOR

The integrator, IC15, inverting input is connected to a reference of approximately +7.5V and the non-inverting input connected via resistors and diodes D1 and D2, to the frequency/phase detector outputs. For a load pulse in phase and at exactly the same frequency as that of the reference, the anode of D1 remains low, i.e. reverse biased and the cathode of D2 remains high, also reverse biased. As error pulses occur at either output, one or other of the diodes is forward biased. This causes the output of

the integrator to go up or down and drive the r.f. oscillator which corrects for the error pulse. With no error pulses the integrator output remains unchanged except that it will fall slightly due to the integrating capacitor having to supply input bias current to the amplifier as well as leakage current through the diodes and stray leakage paths.

The main integrating components of the system are the input resistor from the diodes and the series resistor and capacitor around the amplifier. These are selected to give the required amount of gain to the synthesizer system as a whole. The other capacitors are chosen to filter out the reference frequency of 100Hz without affecting the frequency response of the system which is designed to be 1Hz. These filters are designed to roll off therefore at 10Hz. Without the capacitor across the feedback resistor, correction pulses tend to saturate the output of the integrator causing extended settling time and 100Hz reference modulation of the oscillators.

*Lock indication*

There are two systems of in-lock indication on the SSG520 both derived from the phase detector output. The phase/frequency error pulses are gated together to give a pulse out when either of the detector outputs goes low. These pulses are used to drive a lamp on the front panel via an inverter and a driving transistor. The larger the error pulses the less bright is the lamp. The other system is a retriggerable monostable which is also driven by the error pulses. When error pulses increase beyond a certain width they trigger, and continue to trigger, the monostable until they go below the triggering width. With this system the lock indication is either on or off.

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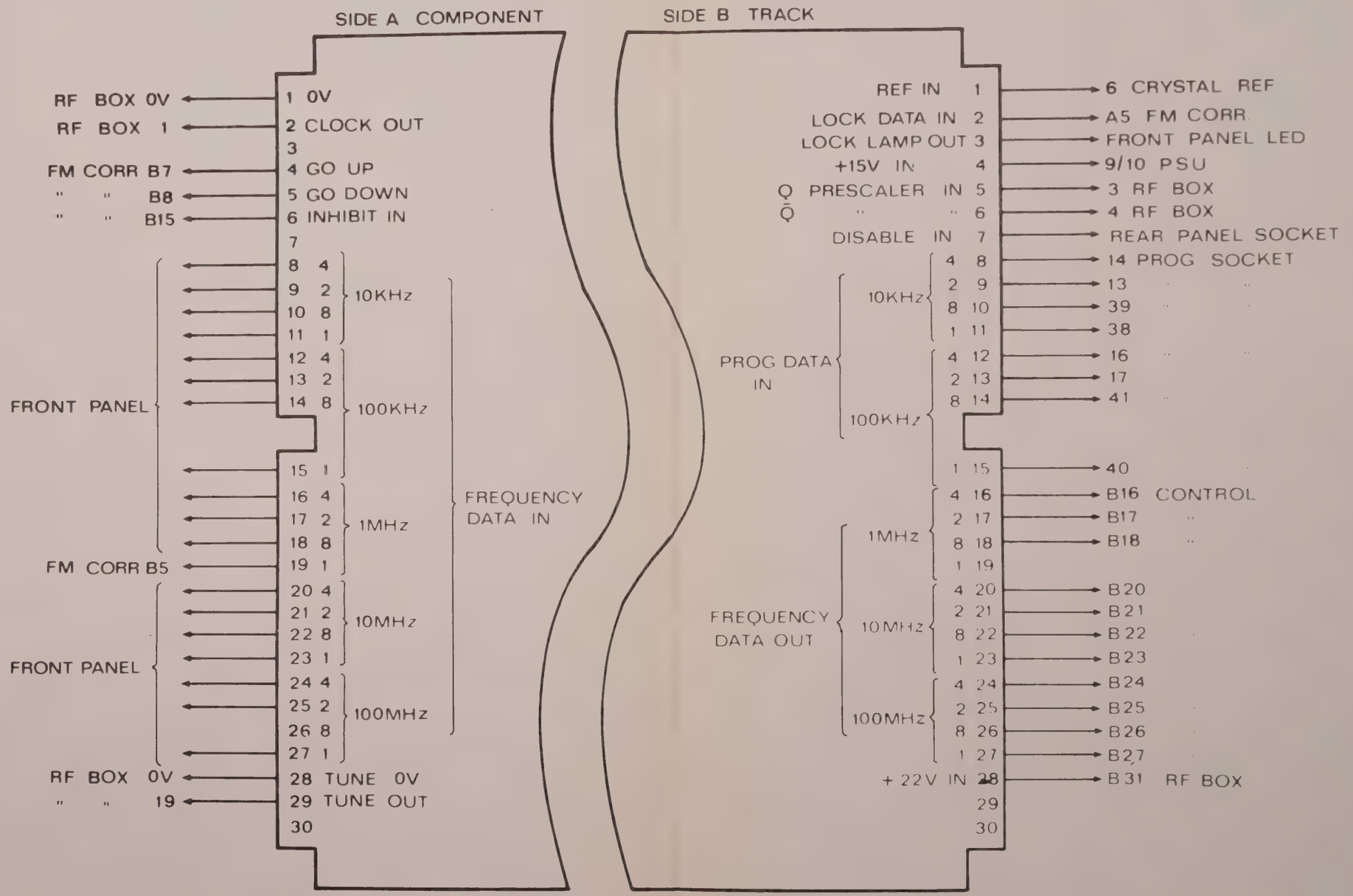


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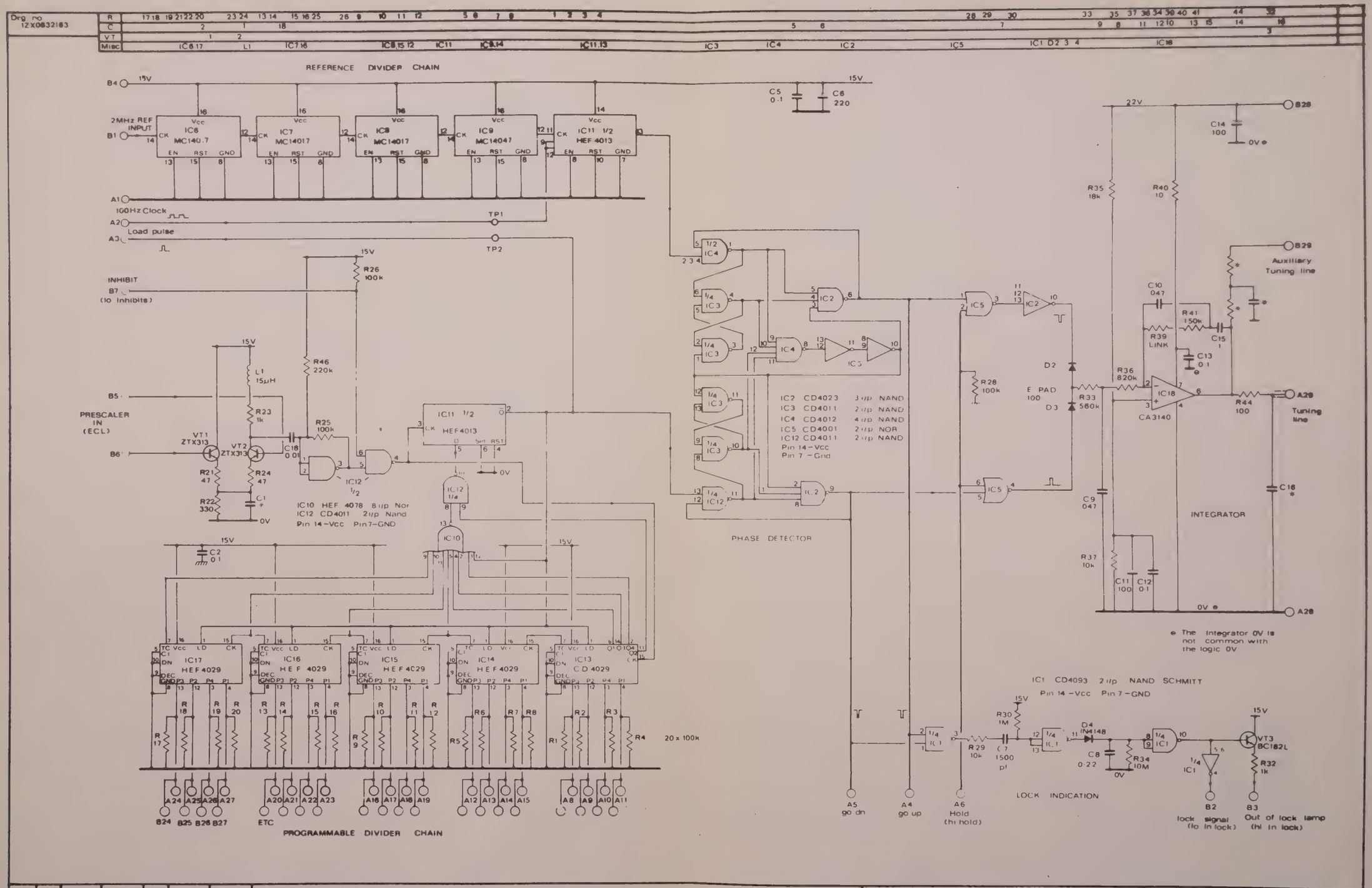

Drg no 1ZX0832163
REFERENCE DIVIDER CHAIN
2MHz REF INPUT
100Hz Clock
Load pulse
INHIBIT
(lo inhibits)
PRESCALER IN (ECL)
IC10 HEF 4078 8 i/p Nor
IC12 CD4011 2 i/p Nand
Pin 14 - Vcc Pin 7 - GND
IC2 CD4023 3 i/p NAND
IC3 CD4011 2 i/p NAND
IC4 CD4012 4 i/p NAND
IC5 CD4001 2 i/p NOR
IC12 CD4011 2 i/p NAND
Pin 14 - Vcc
Pin 7 - Gnd
PHASE DETECTOR
INTEGRATOR
Auxiliary Tuning line
Tuning line
The integrator 0V is not common with the logic 0V
IC1 CD4093 2 i/p NAND SCHMITT
Pin 14 - Vcc Pin 7 - GND
LOCK INDICATION
lock signal (lo in lock)
Out of lock lamp (hi in lock)
PROGRAMMABLE DIVIDER CHAIN
20 x 100k
All Resistor values in ohms
All Capacitor values in µF unless otherwise stated
Refers to c.b side and pin No.
Not fitted
FARNELL INSTRUMENTS LTD. WETHERBY
Title
SYNTHESIZER
SSG520
Section 10 issue 1 11-78
DRAWING No
1ZX0832163
Sheet of Sheets

## THE F.M. CORRECTION BOARD

To frequency modulate the oscillators in the SSG520 the f.m. signal is applied through a potential divider to one end of the tuning varactors. To the other end is applied a d.c. voltage to select the actual centre frequency. The more voltage the less is the capacitance of the varactors and the higher is the r.f. This relationship is not linear, for example, a 1 volt change has much more effect at low voltages (say 3 volts) than at 20 volts. It therefore follows that if an oscillator is frequency modulated at one end of its range with a certain amplitude f.m. signal then the f.m. deviation will be different at other parts of the range.

The function of the f.m. correction circuit is to correct for these changes on a given range, and between ranges so that whatever r.f. is set up the sensitivity of the SSG520 to an f.m. signal is the same.

The principle of operation is that whenever a new frequency is selected (affecting the 1MHz thumbwheels and above) the frequency is moved away by 1MHz and returned by an appropriate d.c. level on the f.m. line. The actual d.c. level depends on the sensitivity of the f.m. line at this r.f. setting. This d.c. level is stored and used to calibrate the incoming f.m. signal.

The common line of the tens and hundreds of kHz thumbwheels is supplied from the +15V supply line whilst the MHz upwards thumbwheels are supplied via a 5k6Ω resistor from the +15V supply, therefore when these thumbwheels are changed the load on this resistor changes due to different combinations of pull-down resistors being switched in. The small change in voltage drop across the 5k6Ω resistor is taken to the f.m. correction board where it is a.c. coupled and amplified by the a.c. amplifier of IC15. This signal is used to set the start latch: ½IC17.

The input amplifier's (IC2) function is to drive the D/A converter R, 2R ladder with either the f.m. signal or a reference signal selected by analogue gates on the amplifier inputs. Logic hi on the start latch output selects the reference whilst in the reset mode logic lo, the f.m. signal is applied via a calibration potentiometer P1. P2 is used to adjust the input impedance of the f.m. correction board to be 10kΩ so that the f.m. range switch attenuating resistors correctly attenuate the incoming f.m. signal.

The D/A converter consists of an R, 2R ladder network with resistance arms switched either to the input of the f.m. amplifier IC10 by one set of analogue gates controlled by the outputs of a seven bit binary counter or switched to ground by another set of analogue gates controllled by the invert of the counter outputs. In parallel with the R, 2R ladder is a 180kΩ resistor, R19. The effective resistance switched in between the input of the D/A converter and its output is dependent on the counter outputs and can vary from being 180kΩ and 127/128ths of 25kΩ in parallel with 180kΩ which is 21.8kΩ.

The f.m. amplifier has four functions, all of which drive the f.m. line of the oscillators. When the f.m. correction logic is in its reset mode the inverting input of the amplifier is connected to the output of the D/A converter, the non-inverting input is connected to 0V. The operational amplifier is acting as a virtual earth amplifier with its input resistor determined by the D/A converter and its feedback resistor is either 25kΩ or 2k5Ω. When the sweep sense switch is switched to 'sweep' the 25kΩ is switched in and the other feedback paths are switched to 0V, when switched to 'f.m.', the 2k5Ω resistor is switched in with the others switched to 0V. When the sweep/f.m. switched is switched to 'f.m.' and the f.m. on/off switch is set to 'off' then the 2k5Ω feedback resistor is switched across the amplifier but the D/A converter resistor ladder is disconnected and switched to ground. IC10 is effectively a voltage follower with the input connected to ground, therefore output is at ground. The reason for this is to remove the f.m. as near to the f.m. control line as is possible so that noise, showing up as residual f.m. is minimised. Thus in one mode when the 25kΩ feedback resistor is switched in, the f.m. amplifier has a gain of from 1.15 down to 0.14 depending on the setting of the seven bit counter. In another mode when the 2k5Ω feedback resistor is switched in, the gain is approximately from 0.15 to 0.014 (approximate because the analogue gate adds some resistance of its own to the feedback resistor which is significant compared with the 2k5Ω resistor). In another mode it is a voltage follower with its input grounded.

The fourth role of the f.m. amplifier is to act as the integrator of a phase locked loop system when the f.m. calibration is in its auxiliary loop sequence. In this instance the feedback resistors R22 and R23 are

grounded, go-up pulses enter the inverting input via D1, go-down pulses via D2 and the integrating capacitor is C12. R38 and C13 form some phase advance to the circuit. Also at this time the non-inverting input of IC10 is connected to ½ the supply rail so that go-up and go-down pulses have equal effect. The D/A converter is disconnected from the inverting input and switched to ground.

When the MHz thumbwheels and above are changed the start latch is set. This substitutes the reference signal path for the f.m. signal, although the reference signal at this time is not present. The f.m. amplifier is set to its 'sweep' mode regardless of the sweep/f.m., or f.m. on/off switch settings. The D/A counter is reset so the input resistor to the f.m. amplifier it 180kΩ. The two d-type flip flops of IC21 which were in the reset condition have the reset removed. A very slow astable oscillator comprising ½IC16, C19, C20 and R47 has its reset removed and is used to time the f.m. calibration procedure so that if for some reason the f.m. calibration is not complete within about 8 seconds the falling edge of the oscillator re-triggers the start latch so that the procedure starts again from the beginning. If, after the oscillator has been started, the thumbwheels are changed again the pulse thus generated is used to re-start the oscillator and to reset the d-type flip flops so that both the time and calibration procedure always start from the last change of thumbwheel setting.

Meanwhile the main synthesizer has gone out of lock (due to the thumbwheel change). When it comes into lock at the frequency set up on the thumbwheel switches (f. set) the 1st d-type's Q output goes hi due to its data input (the start latch output) being already hi. As this occurs the reset on the D/A counter is removed and the MHz thumbwheel setting is moved to 1MHz away.

This is achieved by taking the signal from the 'a' bit of the a, b, c, d outputs of the thumbwheel into an exclusive OR gate and from the output of this gate to the synthesizer. When the second input of the exclusive OR gate is low, the output follows the logic state set on the 1st input and hence the thumbwheel switch. When the second input is hi the output is the invert state of the thumbwheel input so the synthesizer is set to a frequency 1MHz away from that set on the thumbwheels.

The main synthesizer integrator is inhibited and the f.m. amplifier is switched into its auxiliary synthesizer loop state. The part of the main synthesizer which is still working goes out of lock, due to the effective

frequency change, with the auxiliary loop trying to find lock at f.set ±1MHz by moving the f.m. line in the appropriate direction.

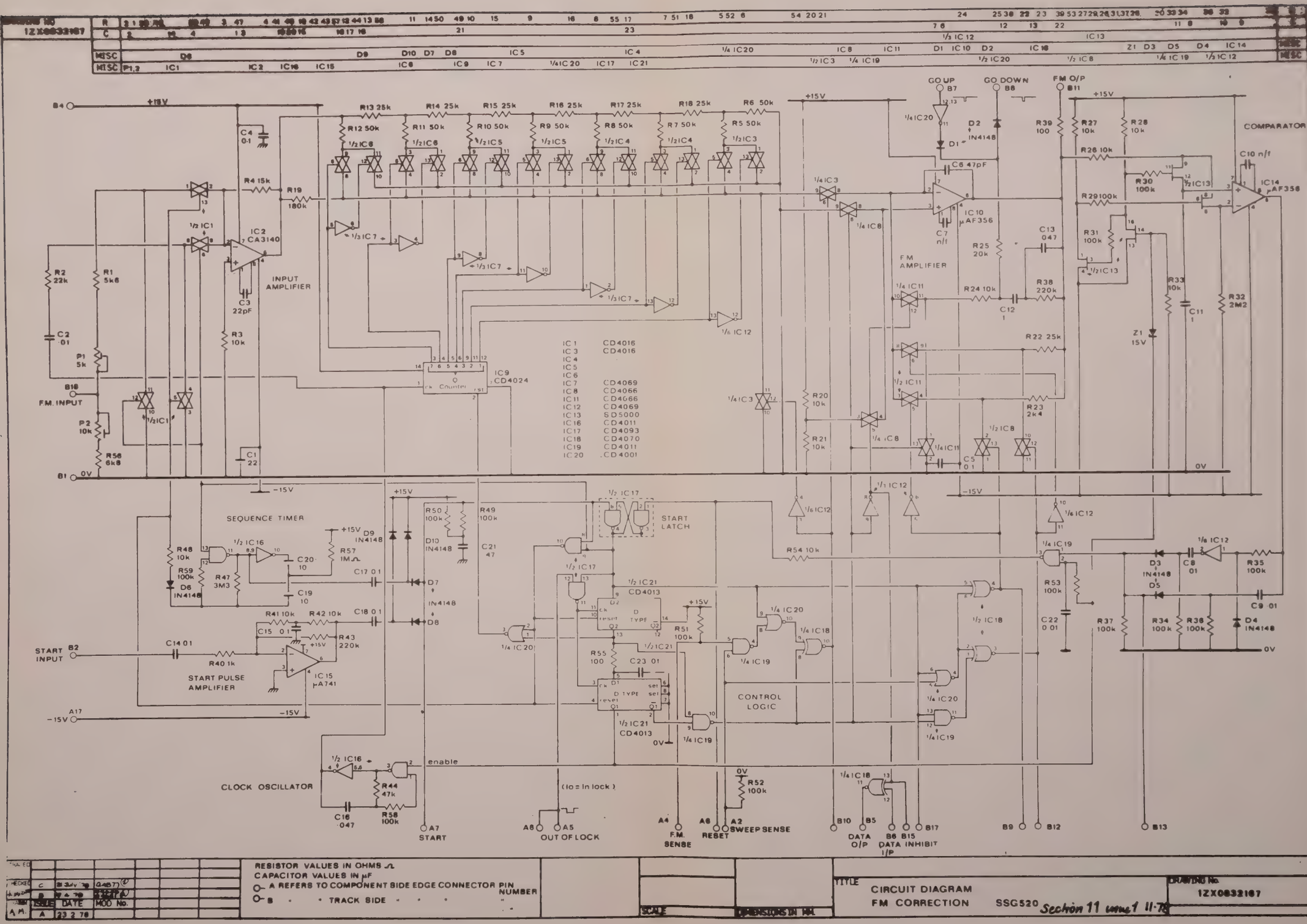
The f.m. amplifier output is at the moment connected to the non-inverting input of the trigger amplifier, IC14, and to a storage capacitor, C11, through a resistor and an f.e.t. switch. The inverting input of this I.C. is connected to -15V via R32 because the f.e.t. switch connecting it to the f.m. amplifier output is turned off, its output is therefore hi.

When the auxiliary loop comes into lock at f.set ±1MHz the Q output of the second flip flop goes hi. This disconnects the non-inverting input and connects the inverting input of the trigger amplifier to the f.m. amplifier output, but the voltage that was previously on the f.m. line is stored on the storage capacitor of C11. Simultaneously the f.m. amplifier is restored to its 'sweep' position, an oscillator which provides a clock pulse for the D/A counter and also after being differentiated provides the reference for the input amplifier is enabled, the synthesizer setting is returned to f.set and the main synthesizer loop inhibit is removed. The gate enabling the reset of the start latch is enabled after the delay created by C22 and R53. (The delay is necessary so that when the inputs of the trigger amplifier are changed over this possible disturbance does not reset the start latch).

As the clock of the D/A counter continues the counter increments and the effective input resistance of the f.m. amplifier gradually decreases, therefore the gain increases and the output signal increases as a positive and negatice spike progressively getting larger until such a point is reached when their amplitude exceeds that stored on the storage capacitor C11. When this occurs, the output of the trigger amplifier changes state. (The direction this takes is the opposite to the direction the auxiliary loop had to go to bring the synthesizer into lock).

If the change is from negative to positive then it is transmitted through C9 and D5 through the NAND gate, now enabled to reset the start latch. If from positive to negative it goes through an inverting gate whose input is protected from the negative excursion by R35 and D4, through C8 and D3 through the NAND gate to the start latch. When this occurs the f.m. amplifier is returned to the mode specified by the sweep/f.m. and f.m. on/off switches, the input amplifier has the f.m. signal path connected to its input, the oscillator acting as the timer for the whole process is cancelled, the two d-type flip flops are reset and the gate enabling the reset of the start

latch is disabled allowing the start latch to be set if the thumbwheel switches are changed again. The clock, incrementing the D/A counter is stopped and the counter remains set at this level. This means that an input signal of the same peak amplitude as the reference signal with the sweep mode selected should give a peak f.m. deviation of 1MHz, or 100kHz in the f.m. mode. P1 is adjusted to give this level. Meanwhile, the main synthesizer loop has been finding lock again at f.set. The cycle of f.m. calibration is completed.




RESISTOR VALUES IN OHMS Ω
CAPACITOR VALUES IN µF
○— A REFERS TO COMPONENT SIDE EDGE CONNECTOR PIN NUMBER
○— B · · · TRACK SIDE · · · · · ·

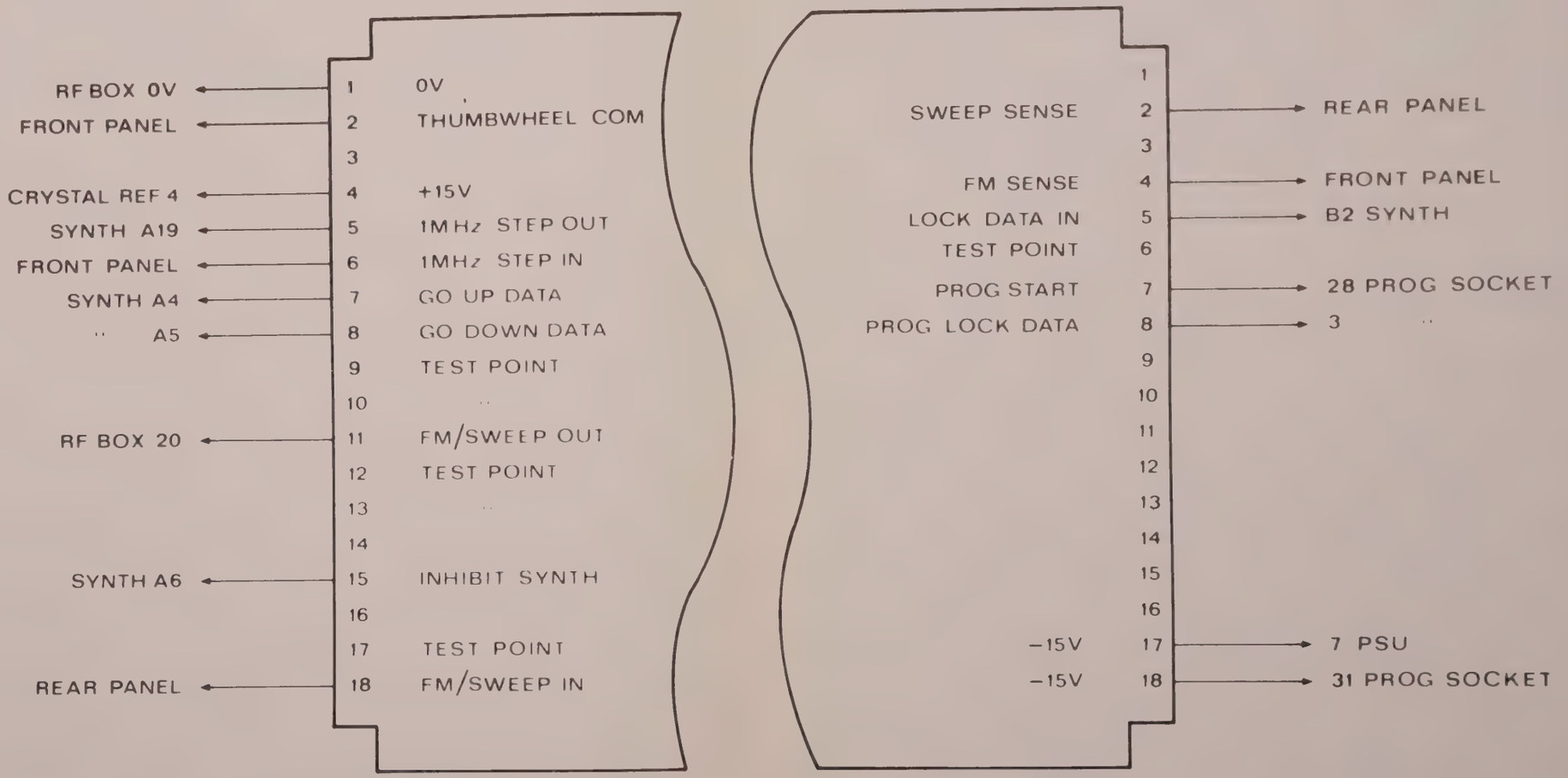
| ISSUE | DATE | MOD No. |
|---|---|---|
| A | 23 2 78 | |

SCALE — DIMENSIONS IN MM

TITLE
CIRCUIT DIAGRAM
FM CORRECTION SSG520 Section 11 issue 1 11-78

DRAWING No.
1ZX0832167

DRAWING NO
3ZV0832277

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| A.M. | A | 25.4.78 | | | | | | |

DIMENSIONS IN MM | SCALE

FARNELL INSTRUMENTS LTD WETHERBY

TITLE
FM CORRECTION BOARD
WIRING SSG520
Section 11 issue 1 11·78

DRAWING NO
2ZV0832277

SHEET OF SHEETS

## THE AUDIO AND SINAD BOARD

On this board is the modulation source, general audio function management and the SINAD measuring section.

Two modulation frequencies are available, switched by relays. The oscillator buffer amplifier IC12 isolates the internal circuits from any load placed on the modulation output.

After modulation selection by the switches on the front panel, two further amplifiers, the f.m. driver IC14 and the a.m. driver IC18, feed the modulation level potentiometers. The a.m. buffer amplifier IC18 then isolates the audio board circuits from the amplitude modulator in the r.f. box. The f.m. buffer amplifier IC15 isolates the audio board from the f.m. range switch and f.m. connection board.

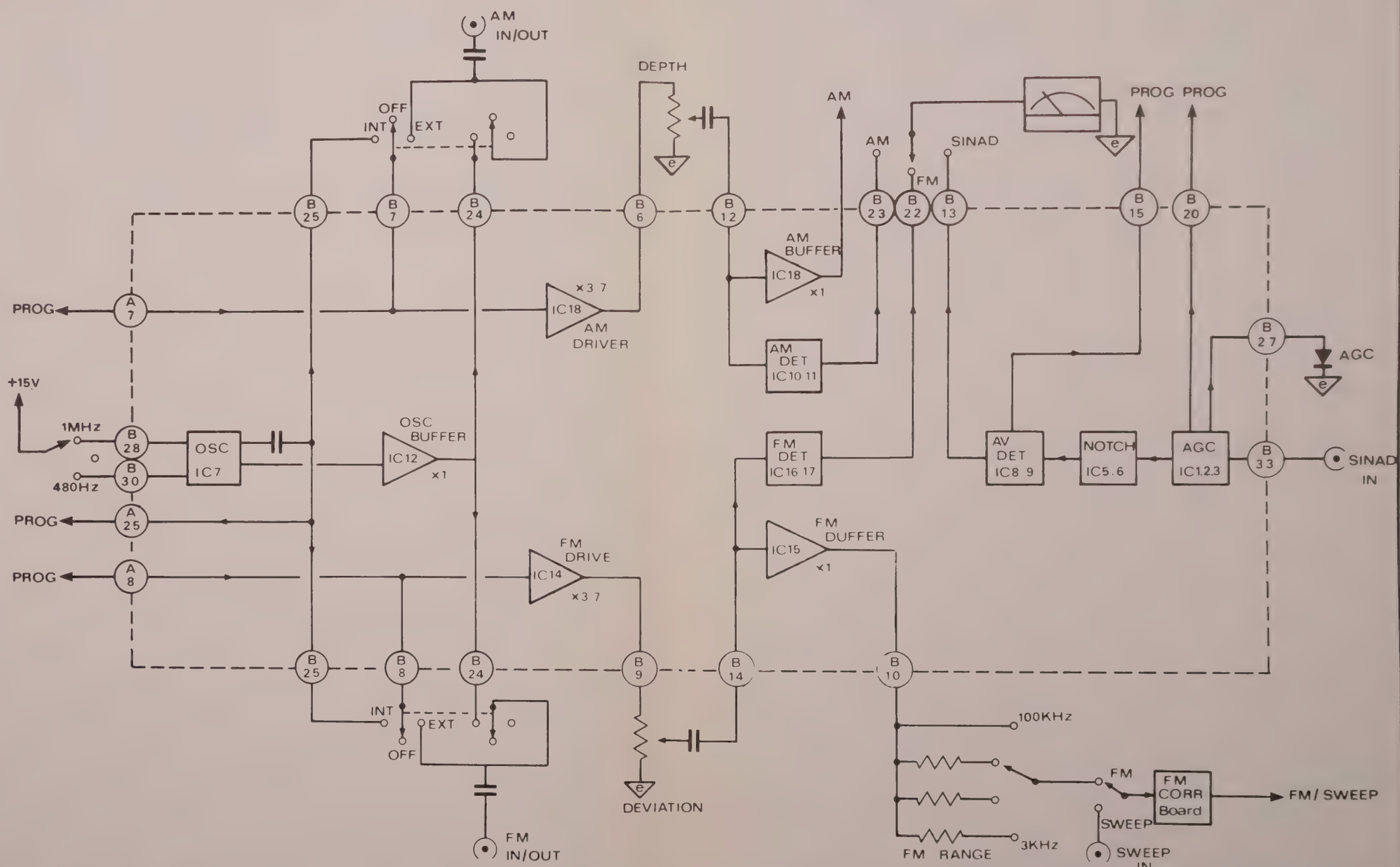
The SINAD meter is in effect an automatic 1kHz distortion analyser. The 1kHz tone is set to a fixed level by the two stage average responding input a.g.c.. IC1 and IC3 are the amplifiers with their output levels detected by D1/D2 and D3/D4 respectively. The diode d.c. outputs are amplified by IC2 and IC4, these amplifiers driving the gain control f.e.t.s VT1 and VT2. An out of range circuit is provided to detect correct a.g.c. operation and illuminates an l.e.d. when the input signal level is suitable.

The 1kHz fundamental is then notched out by IC5 and IC6 which form a Wien bridge type of notch filter. IC8 and IC9 average detect the remaining audio signal level and display on the front panel meter.

The 1kHz audio oscillator of Wien bridge type uses identical value and type frequency defining components as the notch filter. These components are positioned in close proximity on the circuit board thus giving temperature independence of the frequency tuning.

USED ON

DRAWING No. 3ZV0832283

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| DRAWN | J.N. | ISS | DATE | MOD No | | | | | | | |
| | | A | 19.6.78 | — | | | | | | | |

FARNELL INSTRUMENTS LTD. WETHERBY

TITLE: AUDIO BOARD BIOCK DIAGRAM SSG520

DRAWING No. 22V0832283

Section 12 issue 1 11.78

DRAWING No 2ZX0832166

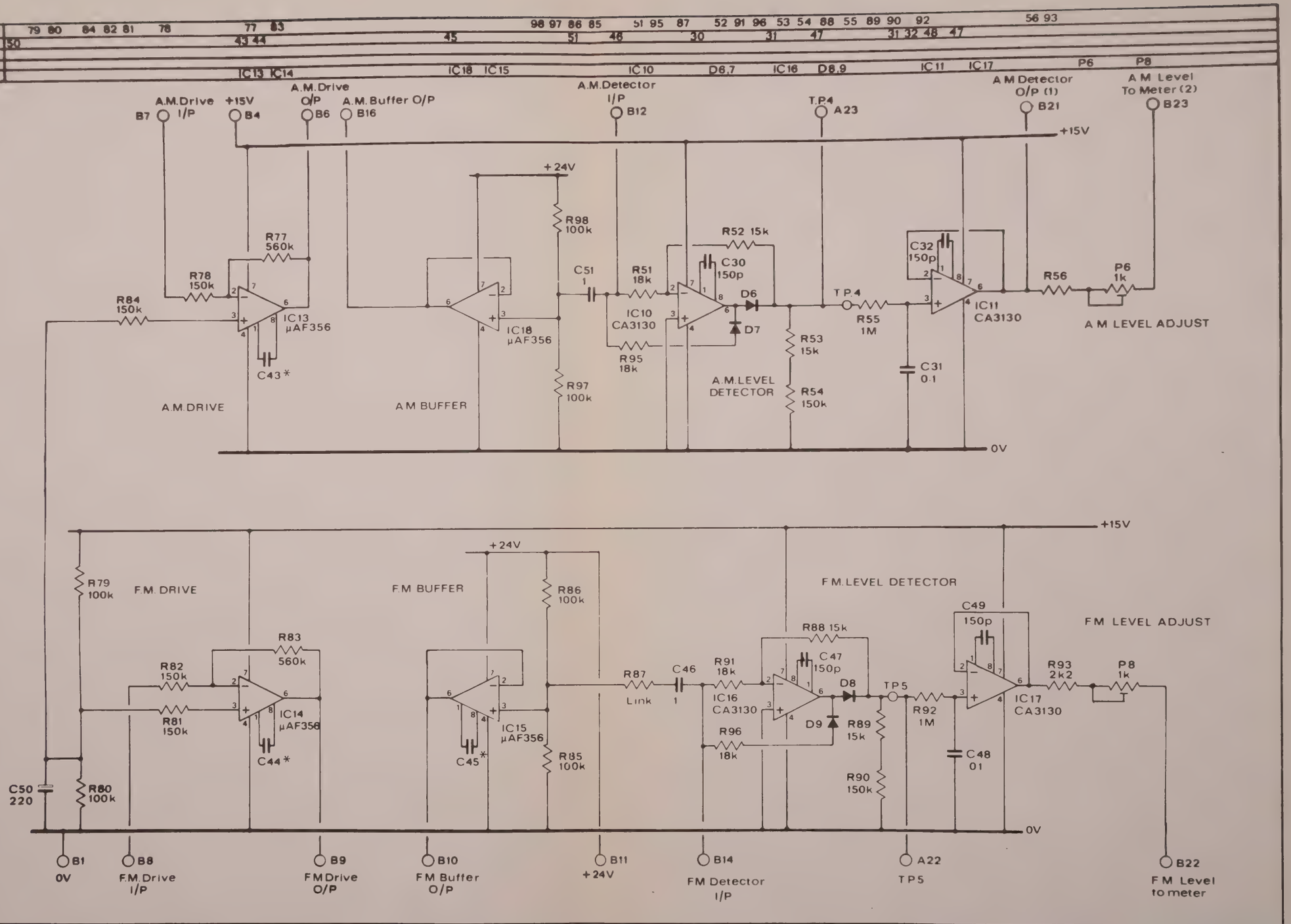
R 79 80 84 82 81 78 77 83 98 97 86 85 51 95 87 52 91 96 53 54 88 55 89 90 92 56 93

C 50 43 44 45 51 46 30 31 47 31 32 48 47

V.T

MISC

MISC IC13 IC14 IC18 IC15 IC10 D6,7 IC16 D8,9 IC11 IC17 P6 P8

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| A.M. | A | 26.1.78 | | | | |

All resistors in ohms
" capacitors in µF
Unless otherwise stated

All diodes are IN4148
* Not fitted
B11 ○ Refers to c.b. side and edge connector no.

Section 12 sheet 11-78

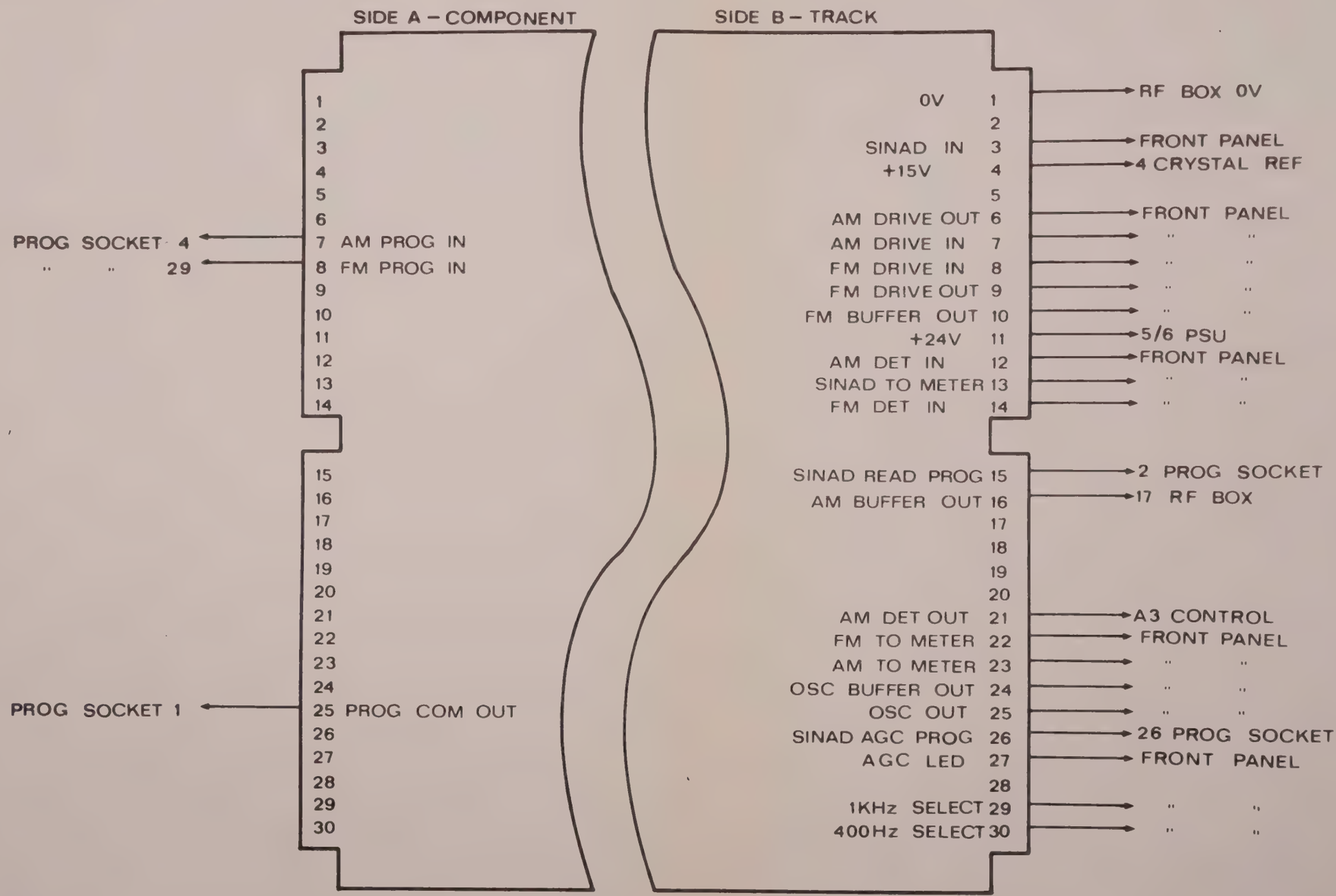
FARNELL INSTRUMENTS LTD WETHERBY

TITLE
AUDIO BOARD
DRIVE AND BUFFER AMPS

DRAWING No.
2ZX0832166

SHEET 2 OF 3 SHEETS

DRAWING No.
3ZV0832273

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| DRAWN | | ISS | DATE | MOD No. | | | | | | | |
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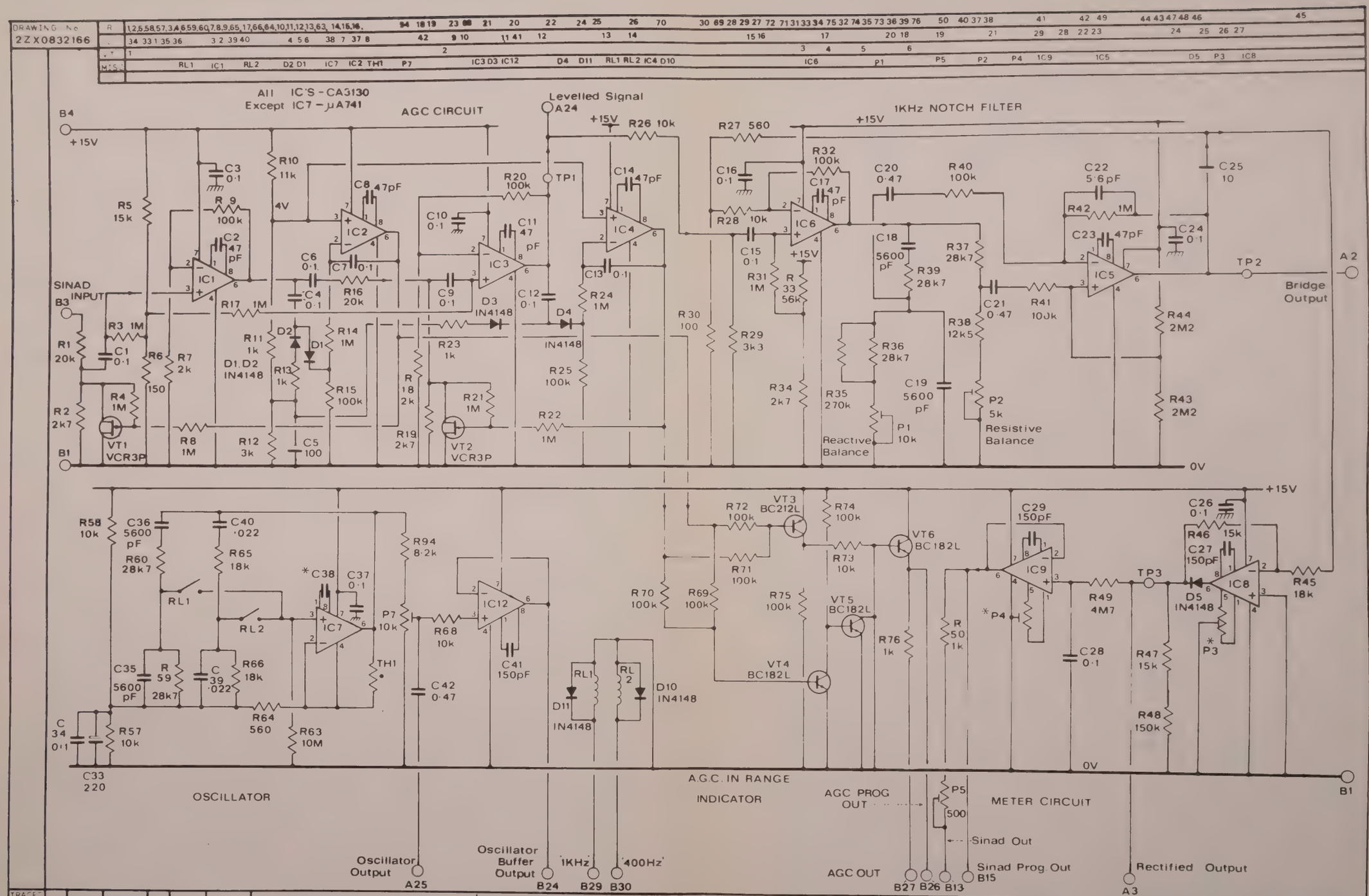
NOTE

FARNELL INSTRUMENTS LTD. WETHERBY.

TITLE
AUDIO BOARD WIRING
SSG520

DRAWING No
3ZV0832273
Section 12 issue 1 11-78


DRAWING No
2ZX0832166
All IC'S - CA3130
Except IC7 - μA741
AGC CIRCUIT
Levelled Signal
A24
1KHz NOTCH FILTER
+15V
B4
SINAD INPUT
B3
B1
0V
A2
Bridge Output
TP1
TP2
TP3
Resistive Balance
Reactive Balance
VT1 VCR3P
VT2 VCR3P
D1,D2 IN4148
D3 IN4148
D4 IN4148
OSCILLATOR
A.G.C. IN RANGE INDICATOR
AGC PROG OUT
METER CIRCUIT
Sinad Out
Sinad Prog Out
Rectified Output
AGC OUT
Oscillator Output
A25
Oscillator Buffer Output
B24
'1KHz'
B29
'400Hz'
B30
B27 B26 B13
B15
A3
All resistors in ohms
" capacitors in μF
Unless other wise stated
B29 refers to c.b. side and pin No.
*Not Fitted
FARNELL INSTRUMENTS LTD WETHERBY
AUDIO BOARD SINAD
SSG520
2ZX0832166
SHEET 1 OF 3 SHEETS
Section 12 issue 1 11-78

## THE CRYSTAL REFERENCE BOARD

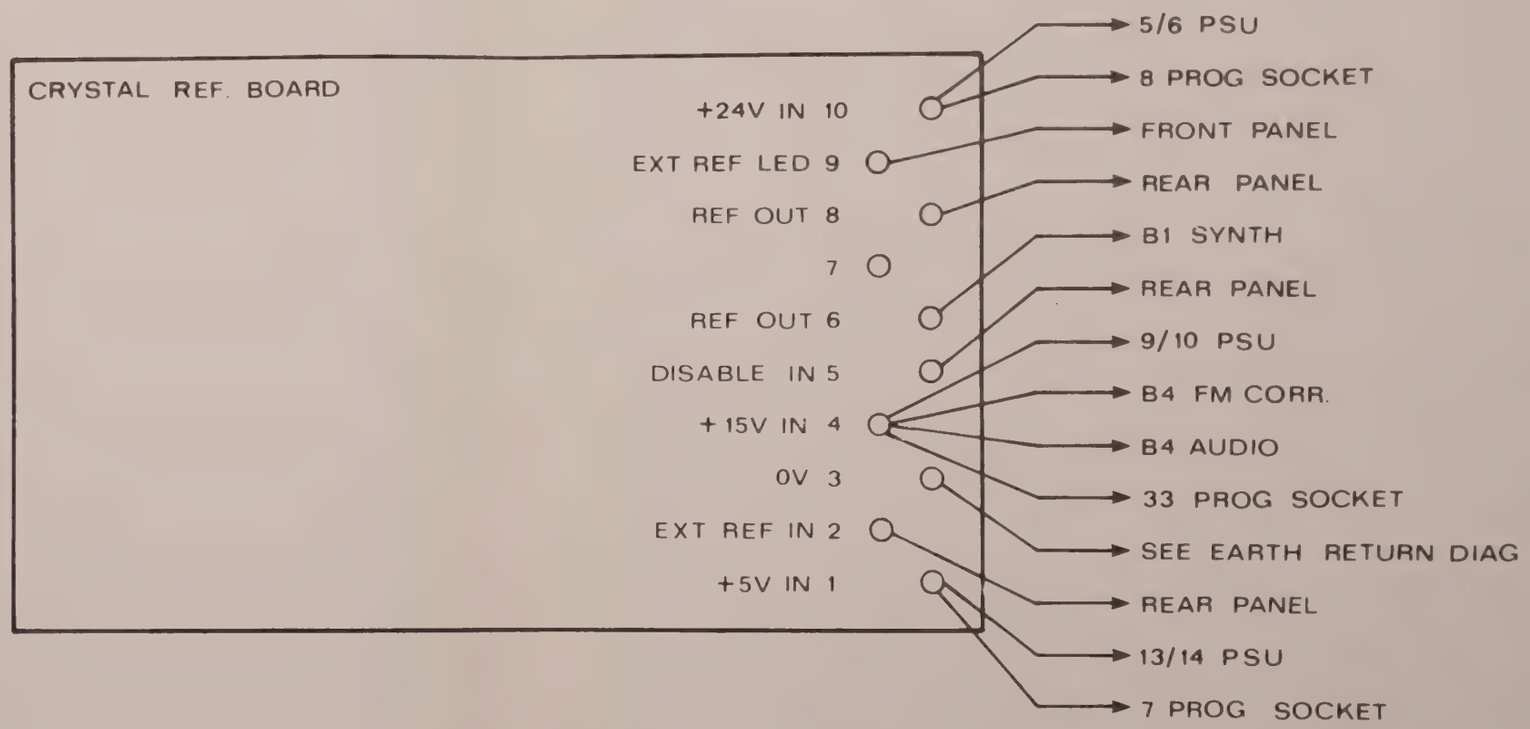
The reference board is designed to accept several alternative crystal oscillator options. Either an ordinary crystal may be fitted or a crystal oven unit with or without fine tuning control.

IC1 forms the oscillator in the first case or an amplifier in the other cases. An external reference signal passes through three gain stages (IC1) before being doubled in frequency by toggling IC2 directly and via an inverter (IC1).

The final section of IC1 drives the detector diode D1 which gates off the output of the internal crystal oscillator unit and substitutes the external reference signal (IC2). This gating signal also operates the front panel l.e.d.

The internal oscillator can also be disabled by a further input from the rear panel for slow sweep purposes.

DRAWING No.
3ZV0832275

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| DRAWN | J.N. | A | 19.6.78 | |

NOTES

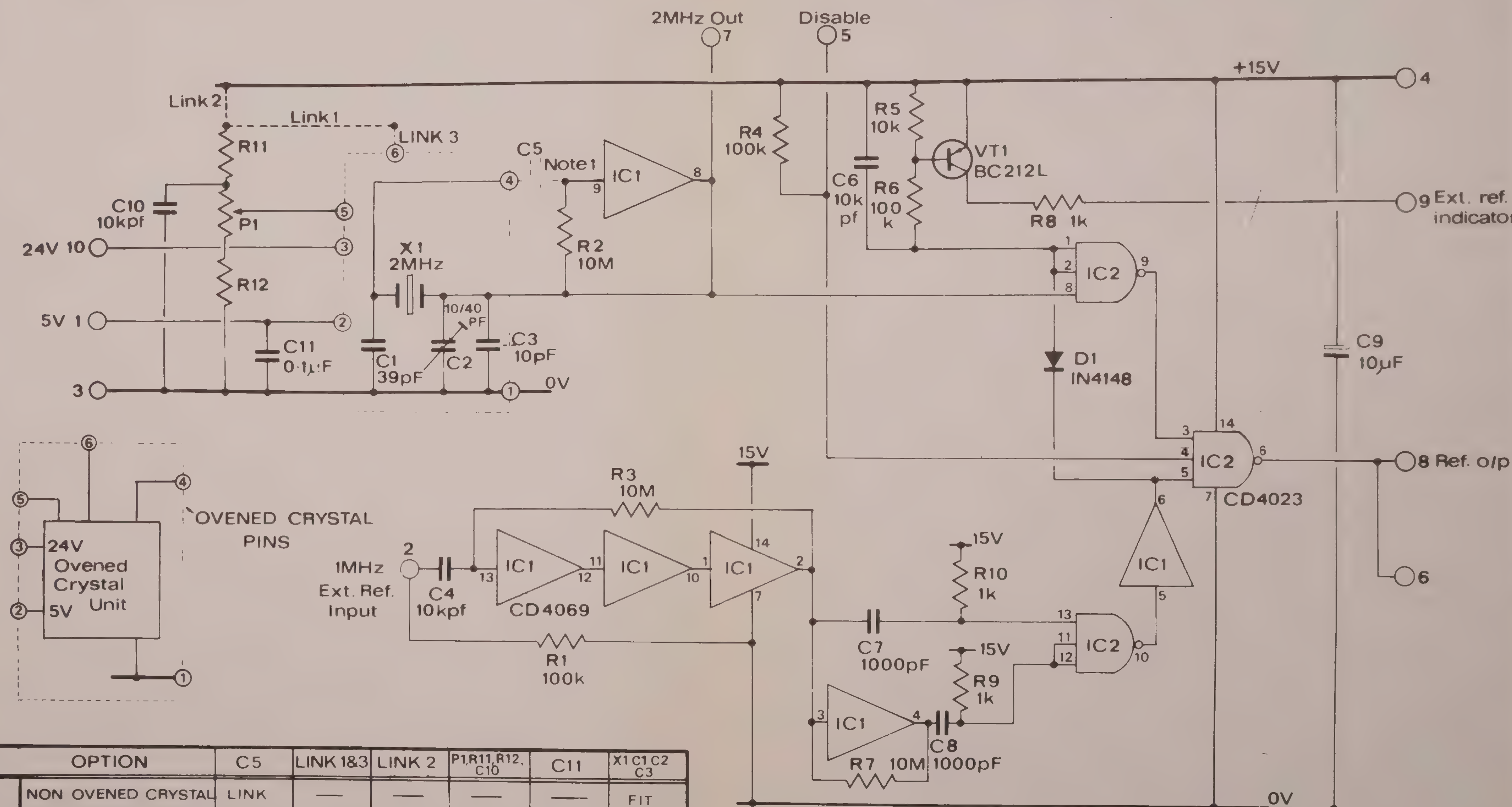
FARNELL INSTRUMENTS LTD. WETHERBY.

TIT.: CRYSTAL REF BOARD WIRING SSG520

DRAWING No.: 3ZV0832275
Section 13 issue 1 11.78

DRAWING No. 3ZX0832164

| | |
|---|---|
| R | 11 12   2 1 3   4   7 5 6   10 9   8 |
| C | 10   11   1 2 4 3   10   6 7   8   9 |
| VT | 1 |
| MISC | P1   X1   IC1   D1   IC2 |




| OPTION | | C5 | LINK 1&3 | LINK 2 | P1,R11,R12, C10 | C11 | X1 C1 C2 C3 |
|---|---|---|---|---|---|---|---|
| | NON OVENED CRYSTAL | LINK | — | — | — | — | FIT |
| A | 4 PIN OVENED CRYSTAL | 01uF | — | — | — | FIT | — |
| | 5 PIN OVENED CRYSTAL VARACTOR TRIMMED | 01uF | — | LINK | FIT | FIT | — |
| | 6 PIN OVENED CRYSTAL VARACTOR TRIMMED | 01uF | LINK | — | FIT | FIT | — |

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| DRAWN | ISS | DATE | MOD No |
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| J.N | D | 20.7.78 | 480S |

NOTE

ALL RESISTORS IN OHMS UNLESS OTHERWISE STATED

FARNELL INSTRUMENTS LTD. WETHERBY.

TITLE

REF OSCILLATOR BOARD

BATCH 4 ONWARDS SSG520

DRAWING No 3ZX0832164

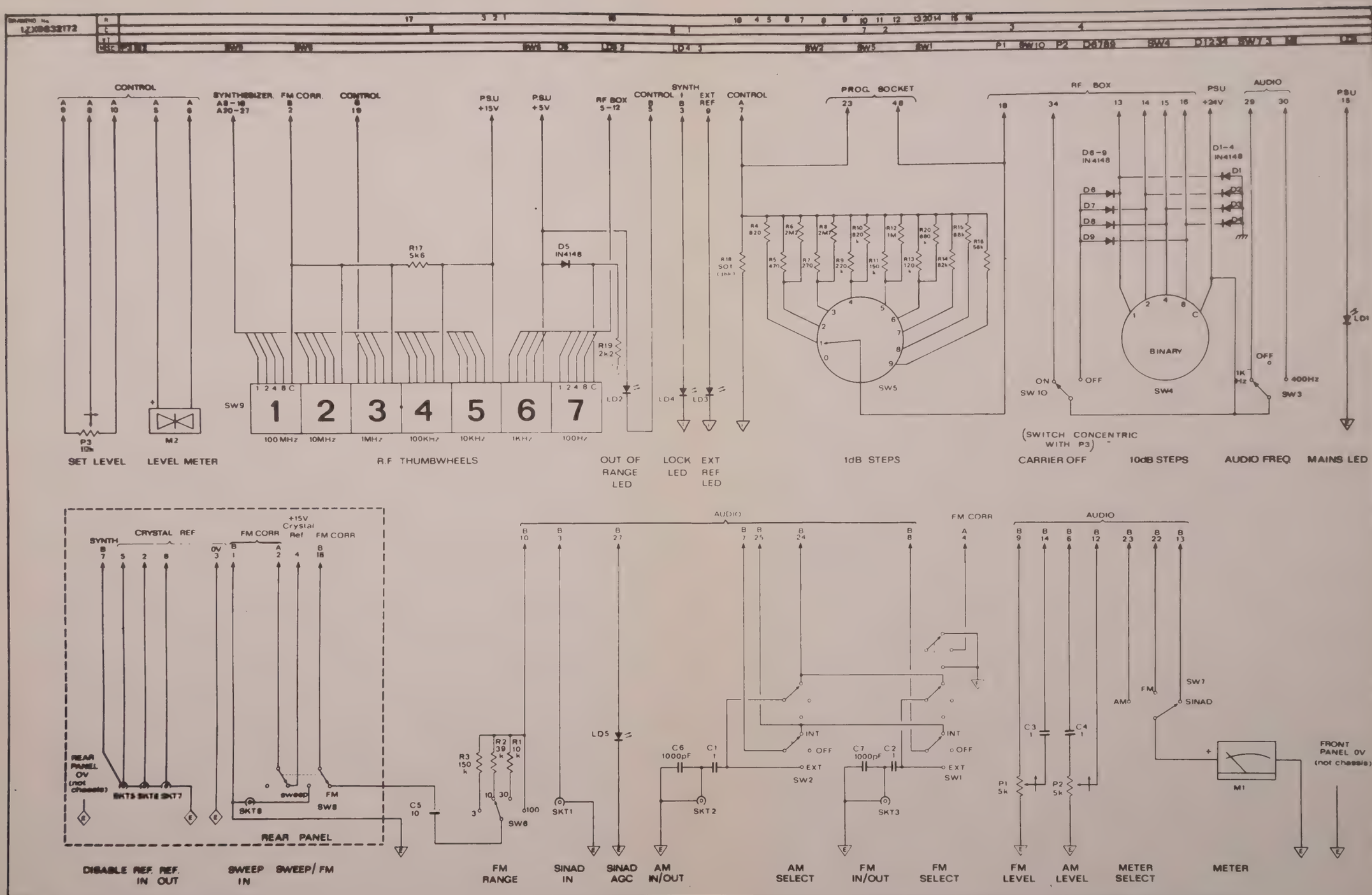
Section 13 issue 1 11·78

SHEET OF SHEETS

## THE FRONT AND REAR PANELS

To avoid any currents flowing through the instrument case, no components on the front and rear panels, with the exception of the r.f. output connector and the multipin programme socket (if fitted) are connected directly to the chassis. All 0V points are taken back to the circuit boards via the wiring loom. There are earth common points on the r.f. box.

| Control | Switch type | Load |
|---|---|---|
| Frequency thumbwheels | 7 decade, 4 line b.c.d. | d.c. levels |
| 10dB steps | 12 position, 4 line binary | " |
| 1dB steps | 1 pole 10 way rotary | " |
| Set level/carrier off | Potentiometer concentric with 1 pole 2 way rotary switch | " |
| FM select | 3 pole 2 way centre off toggle | audio |
| AM select | 2 pole 2 way centre off toggle | " |
| FM range | 1 pole 4 way rotary | " |
| AM level | potentiometer | " |
| FM level | " | " |
| Meter select | 1 pole 3 way rotary | d.c. levels |
| Audio frequency select | 1 pole 2 way centre off toggle | " |
| Sweep/f.m. select | 2 pole 2 way locking toggle | audio |




NOTE

NOTE

Resistor values in ohms
capacitor " " µF
unless otherwise stated

FARNELL INSTRUMENTS LTD. WETHERBY, WEST YORKSHIRE

TITLE

FRONT AND REAR PANEL CIRCUIT DIAGRAM SSG520

Section 14 issue 1 11-78

DRAWING No 1ZX0832172

SHEET 1 OF 1 SHEETS

## THE POWER SUPPLY AND POWER DISTRIBUTION SYSTEM

The power supply consists of five separate regulated voltage rails. All outputs are short circuit protected. The +22 volt rail is adjustable over a limited range and is provided solely to drive the r.f. V.C.O.s and the synthesizer output integrator. The supply is also double regulated to give maximum isolation of these circuits from the rest of the instrument. The +5 volt rail is also adjustable so the output can be set accurately to give the correct supply voltage on the high speed divider circuits in the r.f. box.

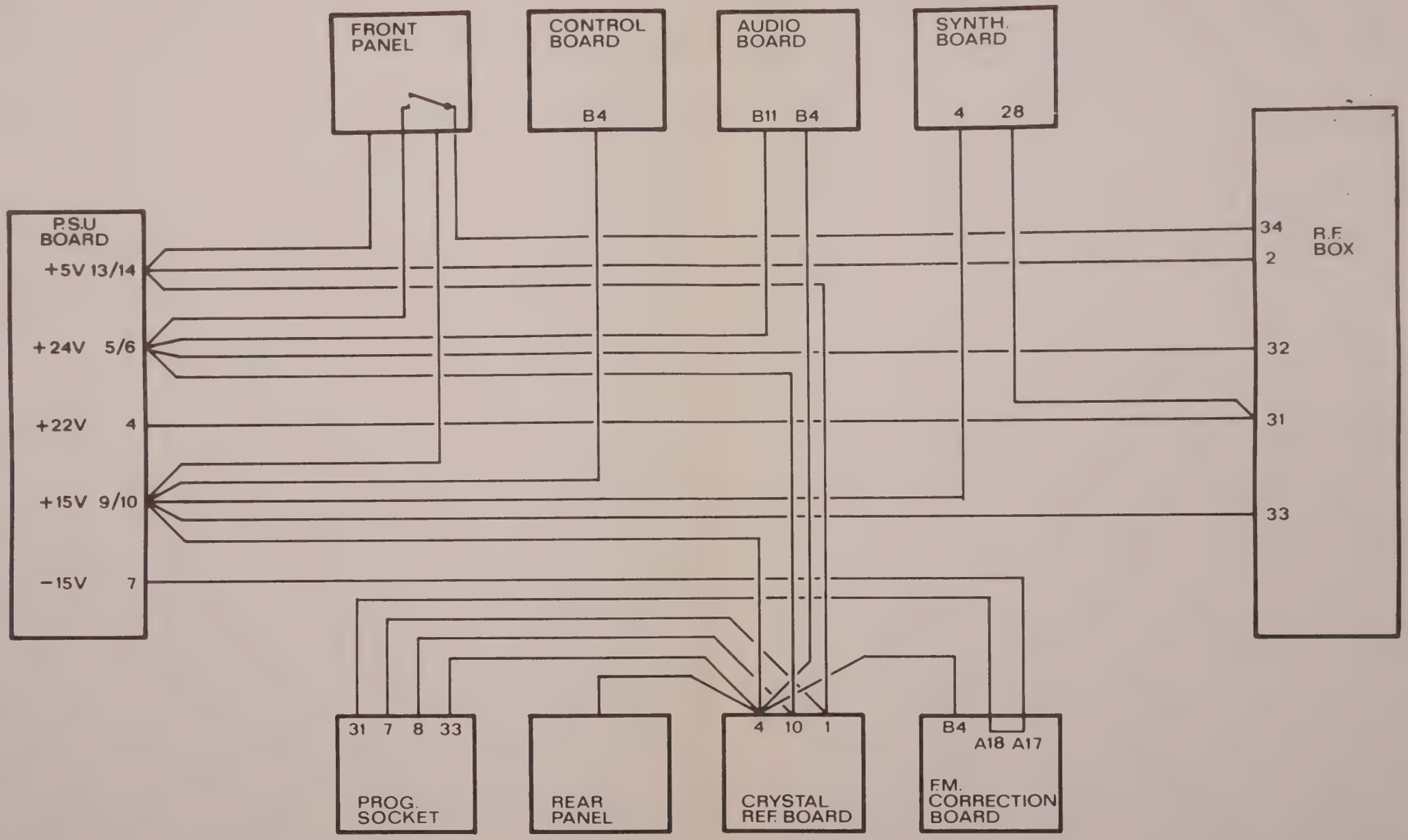
A toroidal mains transformer is fitted to keep down stray fields and improve efficiency. The mains input is also filtered to protect the instrument from external mains borne spurious.

A very clearly defined system of earth returns is employed throughout the instrument mainframe to avoid earth loops. All supply 0 volt lines are taken separately from the power supply unit and earthed to the chassis on the r.f. box. All circuit boards and the front and rear panels have their 0 volt lines connected in such a way that each board has only one return current path back to the r.f. box and wherever necessary separate paths. These paths never cause current to flow through chassis metalwork except the single piece r.f. box lid, where they are all connected on four earth tags.

In a similar way the supply lines to the circuit boards and r.f. box are taken separately from the power supply unit wherever possible. This means each board is isolated from the others and referenced back independently to the power supply regulators with no high current common mode supply paths.

This earth return system and supply isolation technique is of particular relevance to the +22 volt V.C.O. supply. As an additional precaution these supply lines are wired in screened cable.

DRAWING NO
3ZV0832278

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| | A | 2.5.78 | | | | | |

USED ON

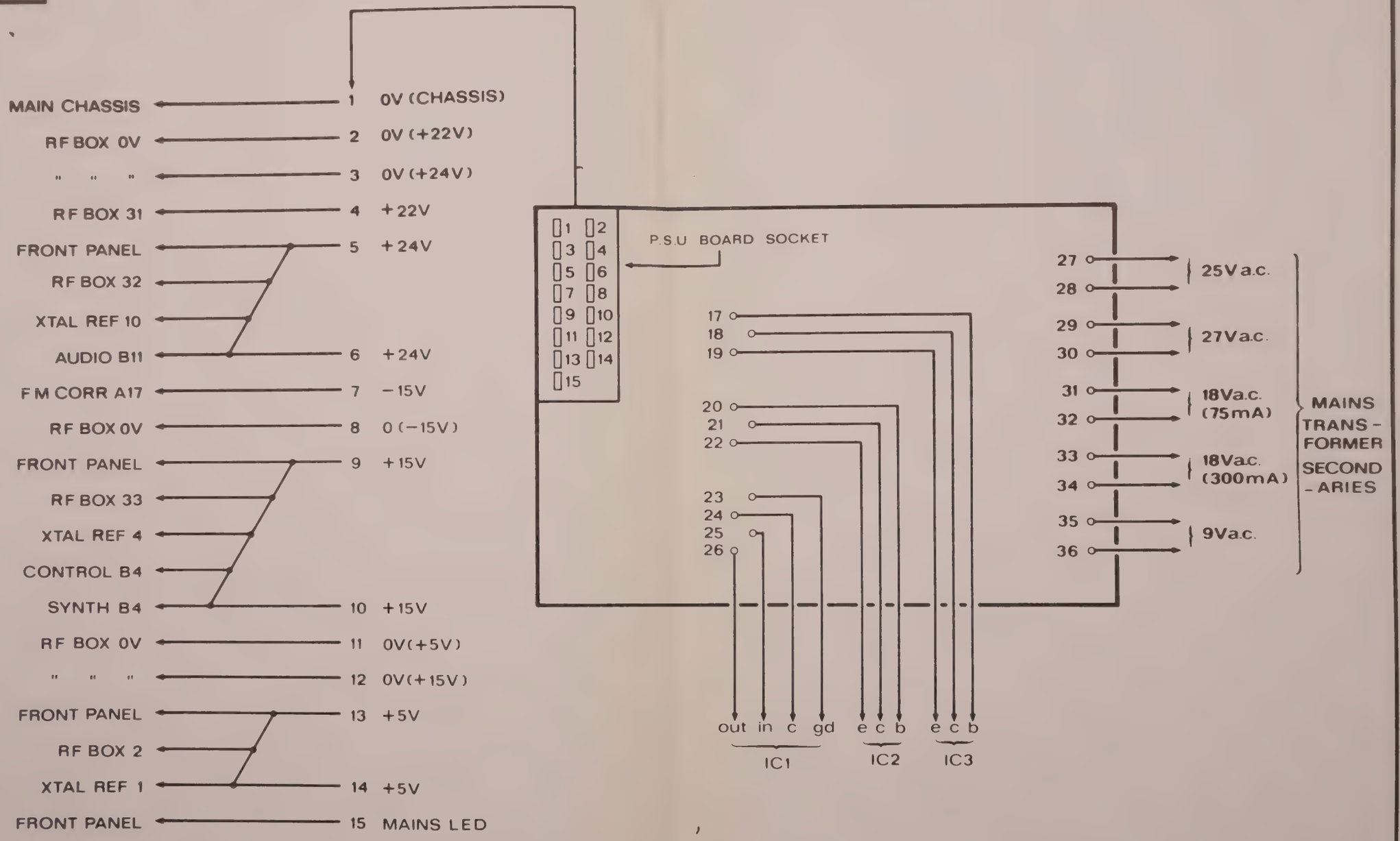
FARNELL INSTRUMENTS LTD. WETHERBY.

TITLE
POWER SUPPLY ROUTING
SSG 520
Section 15 issue 1 11.78

DRAWING NO
3ZV0832278

SHEET OF SHEETS

DRAWING NO
3ZV0832280

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| DRAWN SUEP | ISS | DATE | MOD NO | | | | |
| | A | 2.5.78 | | | | | |

USER ON
832

Section 15 issue 1 11·78

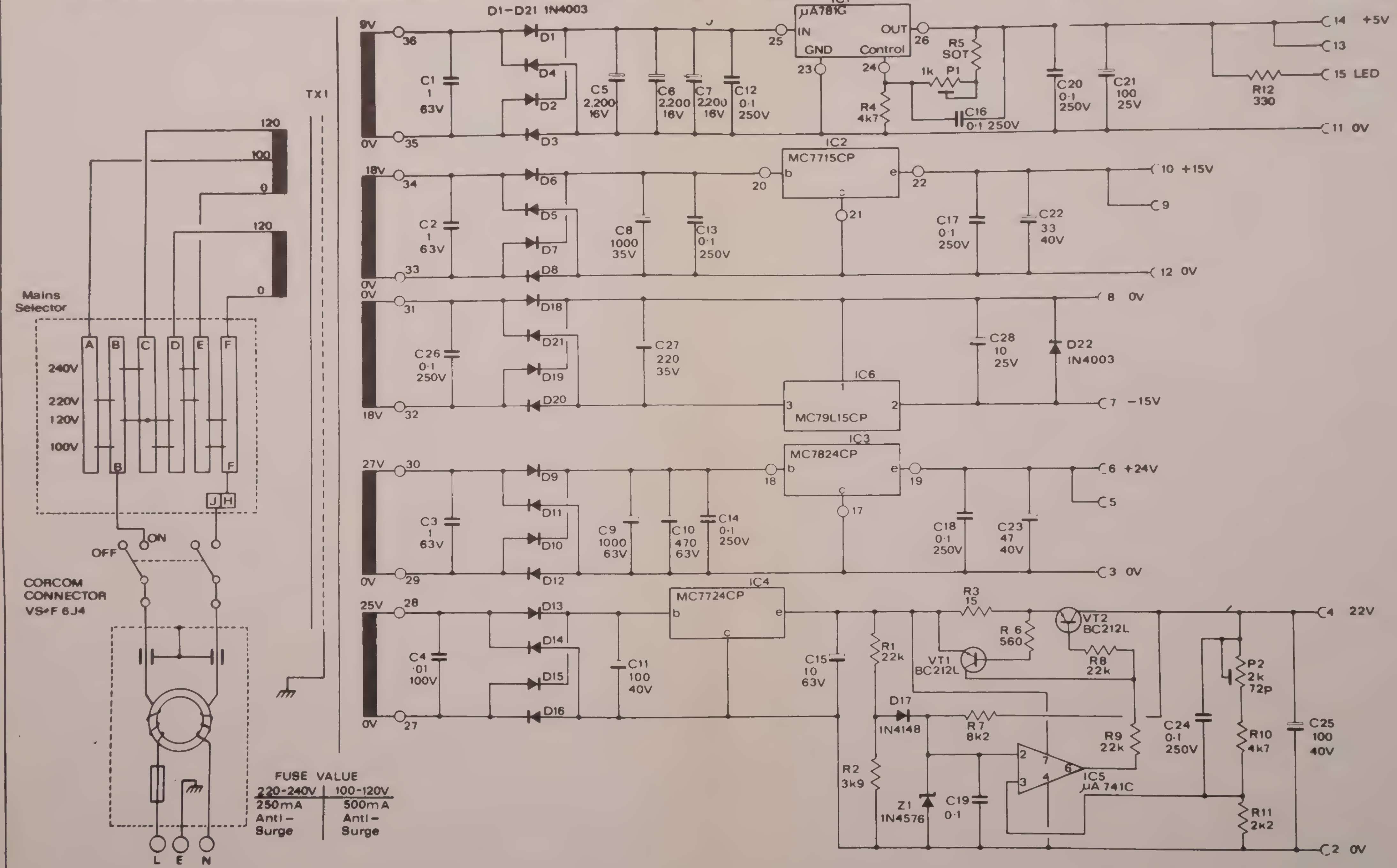
FARNELL INSTRUMENTS LTD. WETHERBY.

TITLE
POWER SUPPLY BOARD
WIRING SSG 520

DRAWING NO
3ZV0832280

SHEET OF SHEETS

DRAWING No 2ZX0832168




All Resistor values in ohms(Ω) unless otherwise stated
" Capacitor " " µf " " "

| TRACED | | | |
|---|---|---|---|
| CHECKED | C | 14.4.78 | P 4642 |
| | B | 18.12.77 | Q 4456p |
| DRAWN | ISS | DATE | MOD No |
| J.N | A | 10.10.77 | |

TOLERANCES

MATERIAL

SCALE

PROTECTIVE FINISH

DIMENSIONS IN MM

NOTE

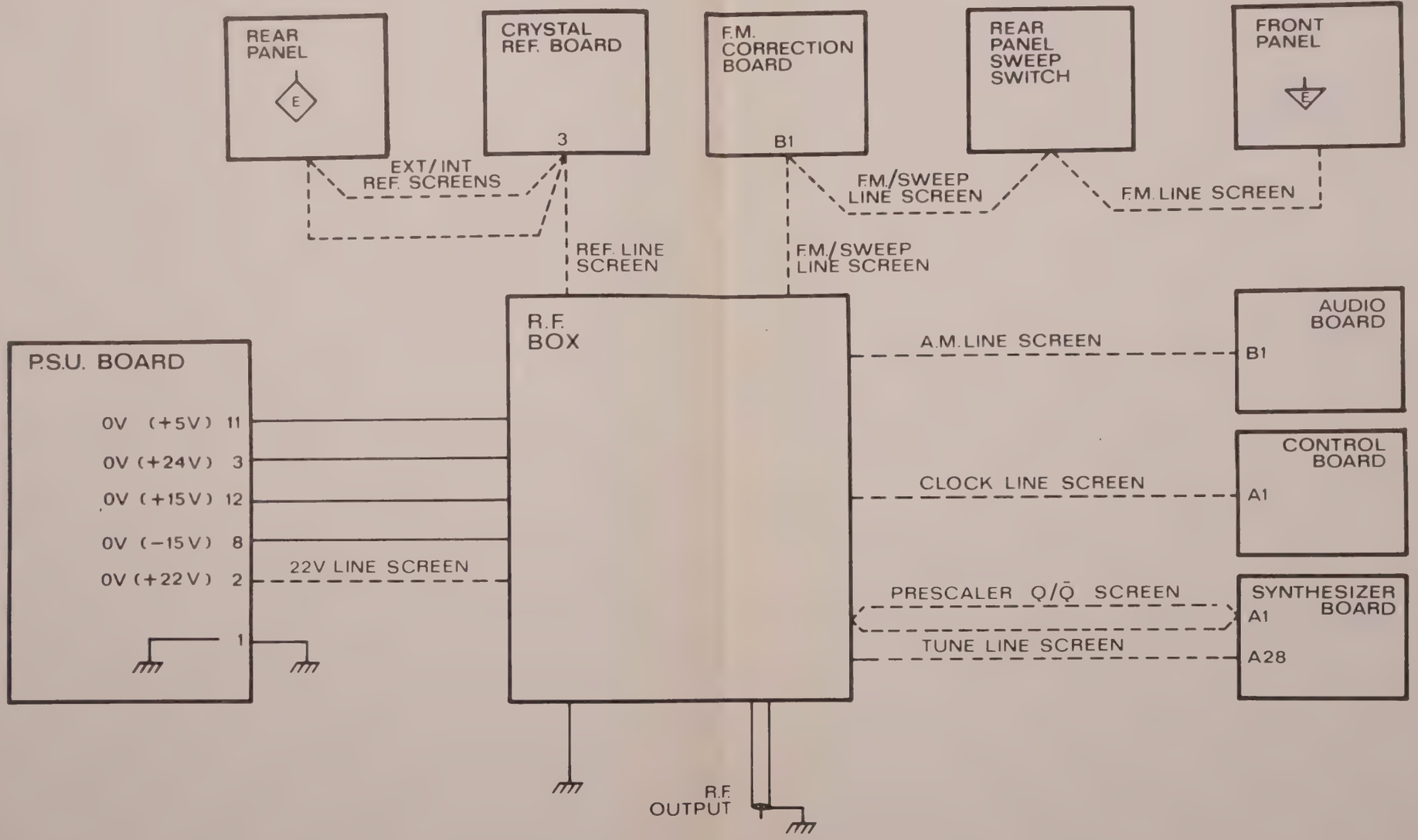
*Section 15 issue 1 11·78*

TITLE: SSG520 POWER SUPPLY CIRCUIT DIAGRAM

DRAWING No 2ZX0832168

SHEET OF SHEETS

DRAWING NO
3ZV0832281

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| DRAWN | ISS | DATE | MOD NO | | | | |
| SJEP | A | 3.5.78 | | | | | |

FARNELL INSTRUMENTS LTD. WETHERBY.

TITLE
EARTH RETURNS
SSG 520 Section 15 issue 1 11·78

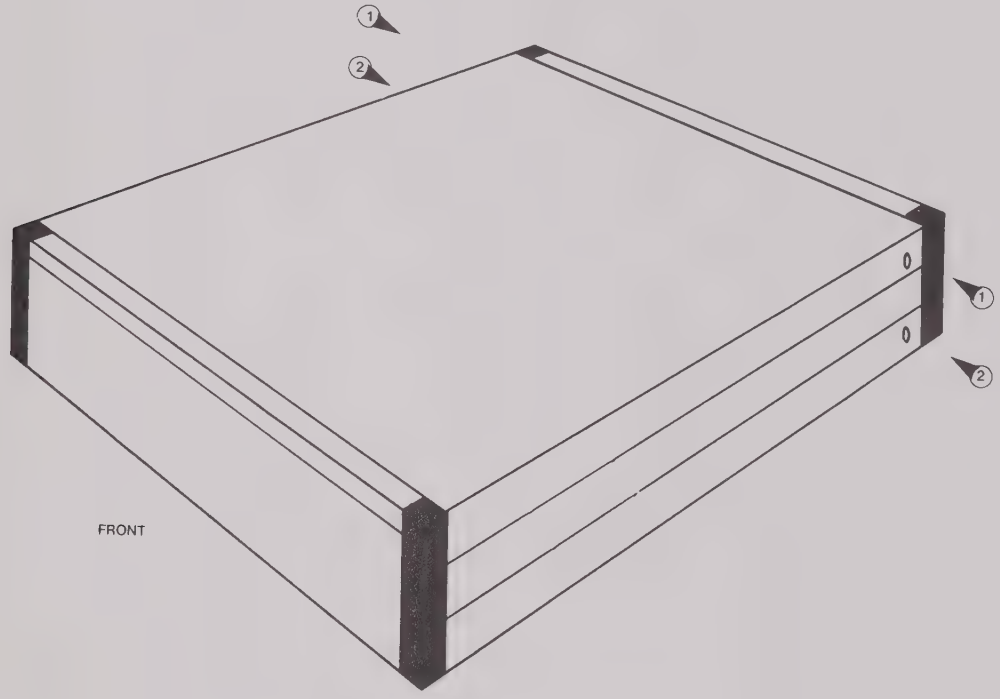
DRAWING NO.
3ZV0832281

SHEET OF SHEETS

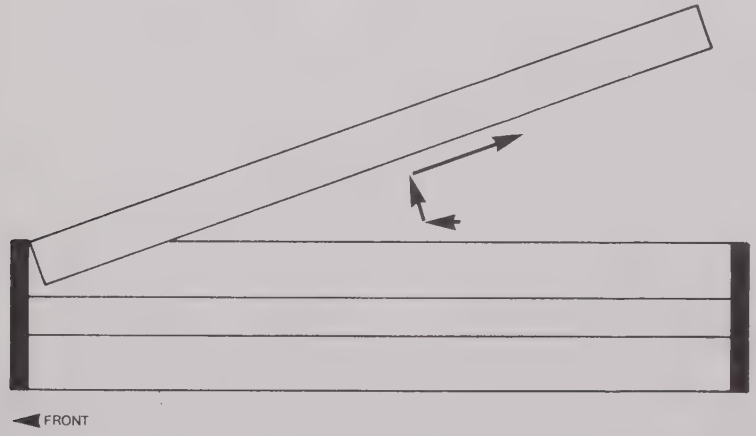
## INSTRUMENT DISMANTLING FOR CALIBRATION OR REPAIR

### *1. Removal of top and bottom lids*

With instrument in normal operating position remove the two small screws in the sides of the upper lid near the back of the instrument (1) . Slide the lid towards the front panel slightly so that the rear edge of the lid clears the locating grooves. Lift the lid off the instrument, rear edge first. Turn the instrument over and repeat the above with the lower lid and lower screws (2) .

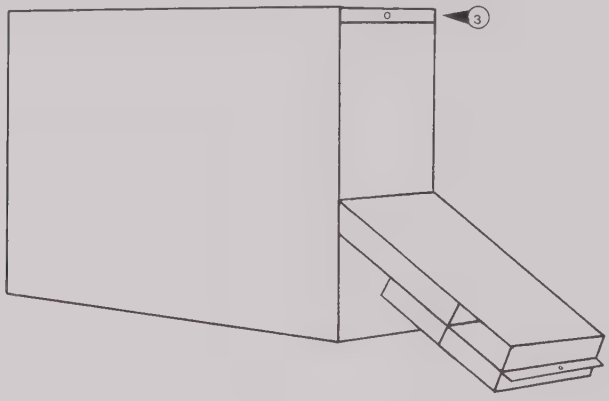



To replace the lids, fit the front edge into the locating grooves behind the front panel whilst holding the lid at an angle with the rear edge clear of the frame. The lid can then be lowered on to the frame. Slide the lid towards the back panel slightly to engage the retaining grooves there and fit the two fixing screws.

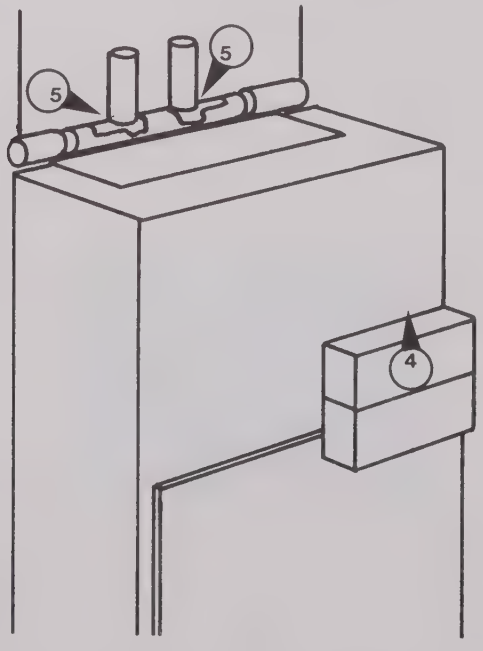


## 2. *Power supply removal*

Stand the instrument on the left hand side (as viewed from the front). Release the quarter-turn fastener retaining the power supply at the edge of the back panel (3) . Gently lower the power unit around the hinge until it rests on the work surface. The power supply can be left in this position if the instrument is to be operated during calibration/repair, or it can be removed completely.




Release the two spring clips retaining the plug to the power supply circuit board and pull off the plug (4) . Slide the two spring-loaded hinge pins on the power supply hinge inwards and rotate them through 90° to retain them in this position (5) . The power unit can now be removed from the main frame.

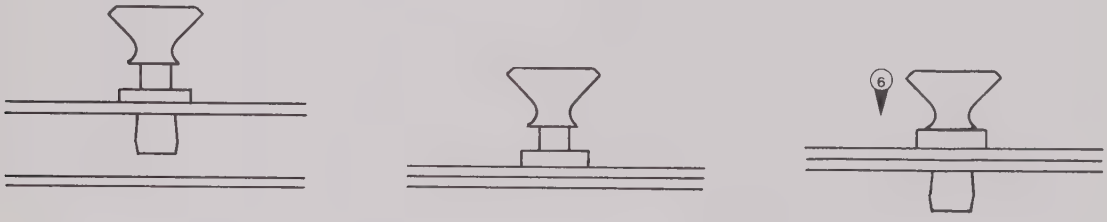



When re-assembling ensure the hinge pins are fully relocated in the hinge assembly and that the power supply board plug retaining clips are secure.

## 3. *Plug-in circuit board access*

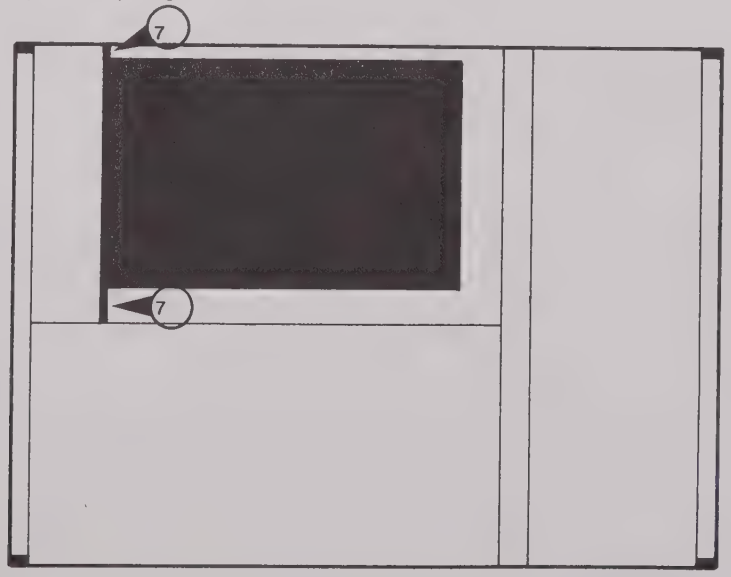
The four large circuit boards (range control, synthesizer, f.m. correction and audio/SINAD) are all plugged into hinged sockets. At the other edge the boards are retained by plastic push-pull fasteners. With the instrument on its side, all four boards can be hinged out simultaneously at right angles to the chassis. To release the board pull on the black plastic fastener.

When replacing ensure the circuit board is correctly positioned and the plastic fastener body fully seated in the chassis before pushing in the plunger to lock the fixing (6) .




## 4. *R.F. box cover withdrawal*

Access to the r.f. enclosure is obtained by releasing the four corner quarter-turn fasteners (7) . The cover may then be pulled along the guide bars and through the hole in the rear panel using the handle fixed to the end of the cover. Be careful when sliding the lid that it does not touch any components or wires inside the r.f. enclosure. When the lid is fully withdrawn it covers the mains switch on the power supply, so if the unit is to be operated with the r.f. lid withdrawn, leave the switch on and switch the unit at the main power plug.



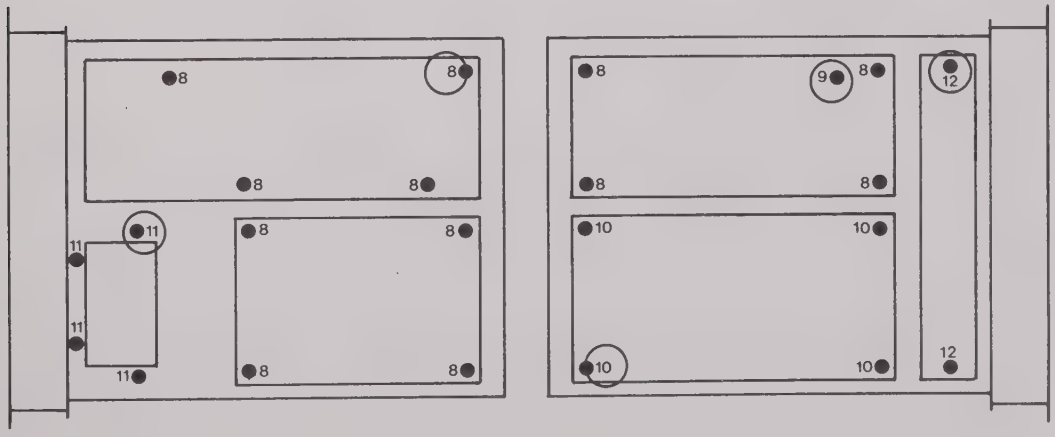
With the unit on its side the r.f. lid can be locked out by easing the heads of the quarter-turn fasteners through the chassis holes provided thus holding the lid away from the r.f. box components. When working in the enclosure be careful not to damage the two metal mesh r.f. gaskets and their mating surfaces.

## 5. *Operation of the unit with mains power applied*

At all times be wary of causing short circuits with any metal tools. Beyond this dismantling of the unit to this stage involves no special precautions to safeguard the operation or instrument because all dangerous voltages are contained in the totally enclosed power supply section. The instrument can therefore be operated and serviced with complete safety. Provided the power supply main section is not opened further dismantling can still be performed with complete operator safety, but special care must be exercised when removing screwed-in circuit boards and components. This particularly applies to the wiring connections if the power is applied and the unit operating, because short circuits could occur and circuit damage result.

## 6. *Removal of the r.f. enclosure boards*

With the unit placed on its left hand side, the looms to the four circuit boards in the r.f. enclosure are arranged to run along the lower edges, so after the board fixing screws have been removed (8) the boards can be hinged downwards for access to the back. Take care when the instrument is switched on that the wiring, tracks and components do not inadvertently touch each other or the chassis.



The output amplifier board can only be removed after the solid output coaxitube has been removed (9) . Lift the resistor off the coax inner conductor and, with care, completely unsolder the coax outer conductor on the circuit board. The board can then be slid off the output coaxitube. When replacing, the coaxial outer conductor must be soldered all the way round where it meets the board. This ensures continuous earth contact.

The prescaler circuit board has a metal shield fitted over it and this must be removed for access (10) . Some of the metal shields are tack-soldered to improve their effectiveness. These joints must be broken to remove the shield and remade in the same place when re-assembling.

A stripline oscillator can be removed for access to the components under the tuned lines by removing the four nuts fixing the assembly to the r.f. box centre plate (11) .

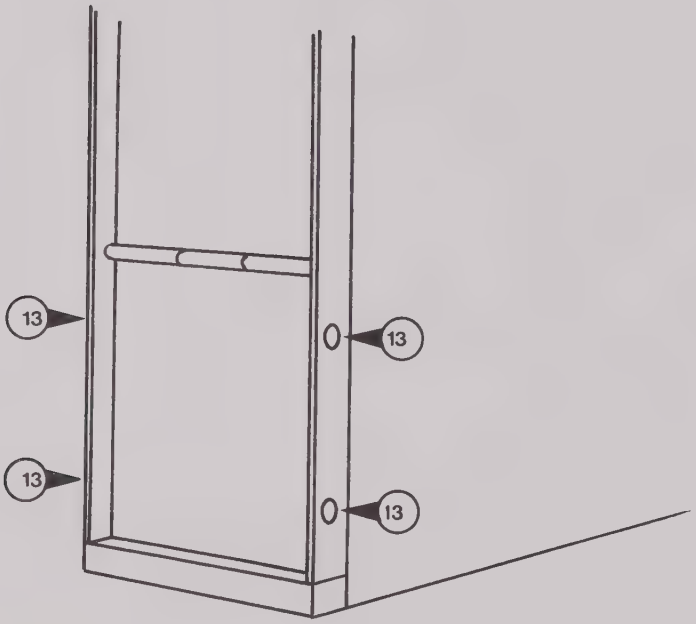
7. *Output attenuator removal*

After removing the output amplifier from the attenuator input coaxitube, remove the attenuator output coaxitube from the connector on the r.f. box and then remove the two attenuator fixing nuts (12) . Access to the attenuator relays is obtained by unscrewing the appropriate locking ring on the back of the attenuator assembly. The relays can be withdrawn out of the back of the assembly after unsoldering the r.f. connections inside the attenuator. The two 40dB attenuator sections have metal foil covers soldered over them to isolate them from the r.f. radiation inside the r.f. box. These covers must be removed before access can be obtained to the 40dB sections. When replacing the foil (preferably with new material) ensure a continuous soldered joint all the way round using the minimum of heat.

When components are replaced inside the attenuator ensure they are positioned exactly where the old components were and with the same lead lengths.

## 8. Rear panel removal

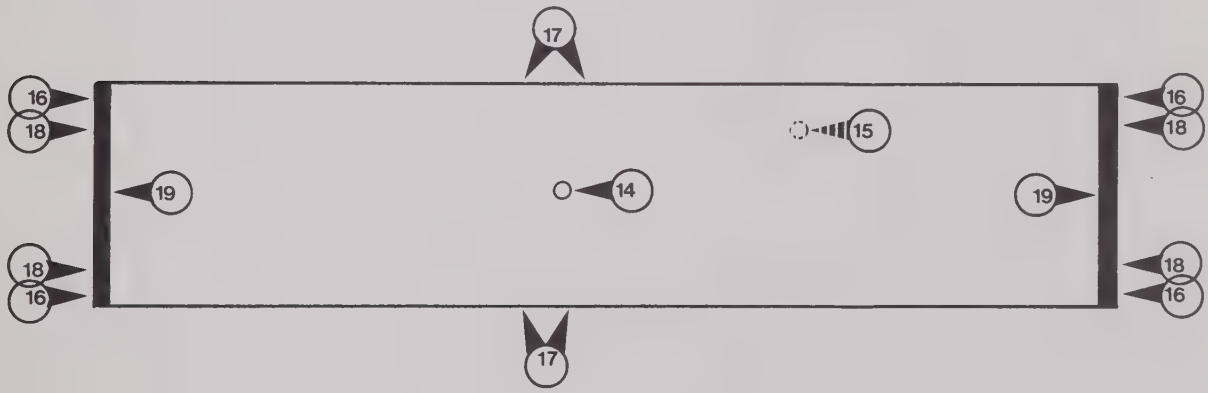
The small fixed portion of the rear panel must be removed for access to the crystal reference oscillator board. Remove the power supply completely and remove the four screws fixing the rear panel to the top and bottom rear chassis bars (13) . The panel may then be eased away from the chassis and hinged round on the wiring loom. In this position the power unit may be refixed if instrument operation is required. The crystal reference board is retained by four screws.



## 9. *Front panel removal*

Remove the mains push knob. Access to the collet fixing is obtained after pulling off the knob cap (14) . Remove the spring behind the knob. Remove the power supply assembly and slide the mains push rod out of the back of the instrument. Disconnect the r.f. connector from the front of the r.f. box (15) . Remove the two front panel side mouldings (16) . Remove the four screws holding the two gusset plates to the centre of the front panel (17) . Turn the instrument upside down and remove the four screws holding the front panel to the chassis side plates (18) . The two small aluminium filler extrusions at each side of the front panel will be released at this stage (19) . The front panel can now be pivoted downwards on the looming for access to the front panel components and wiring.

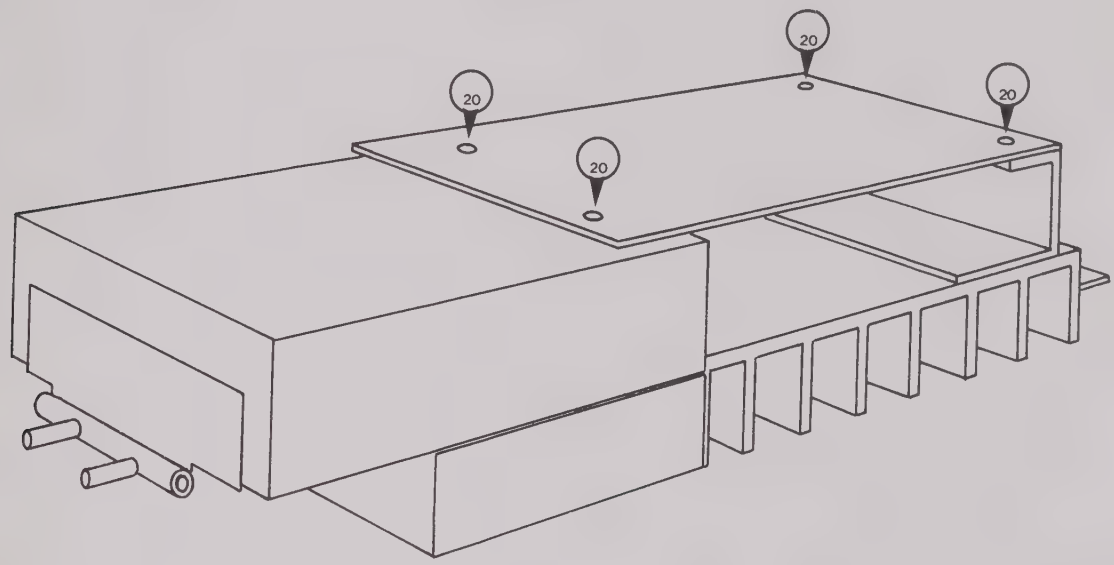
When replacing the mains push rod ensure the anti-rotation bolt at the back of the rod is passed through the hole provided in the chassis.



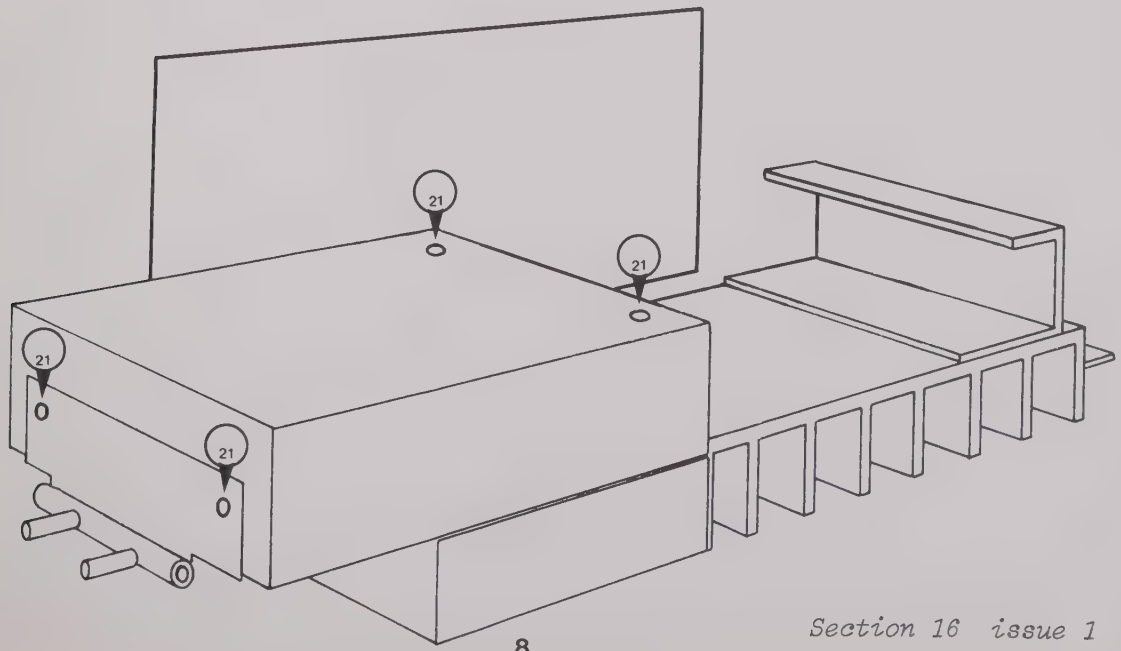
## 10. *Power supply dismantling*

WARNING - The power unit contains hazardous voltages when connected to a power source.

The circuit board may be detached by removing the two screws and two nuts retaining it (20) . The board may then be pivoted over to gain access to the reverse side and to the regulators on the heatsink. This may be done with the unit operating.

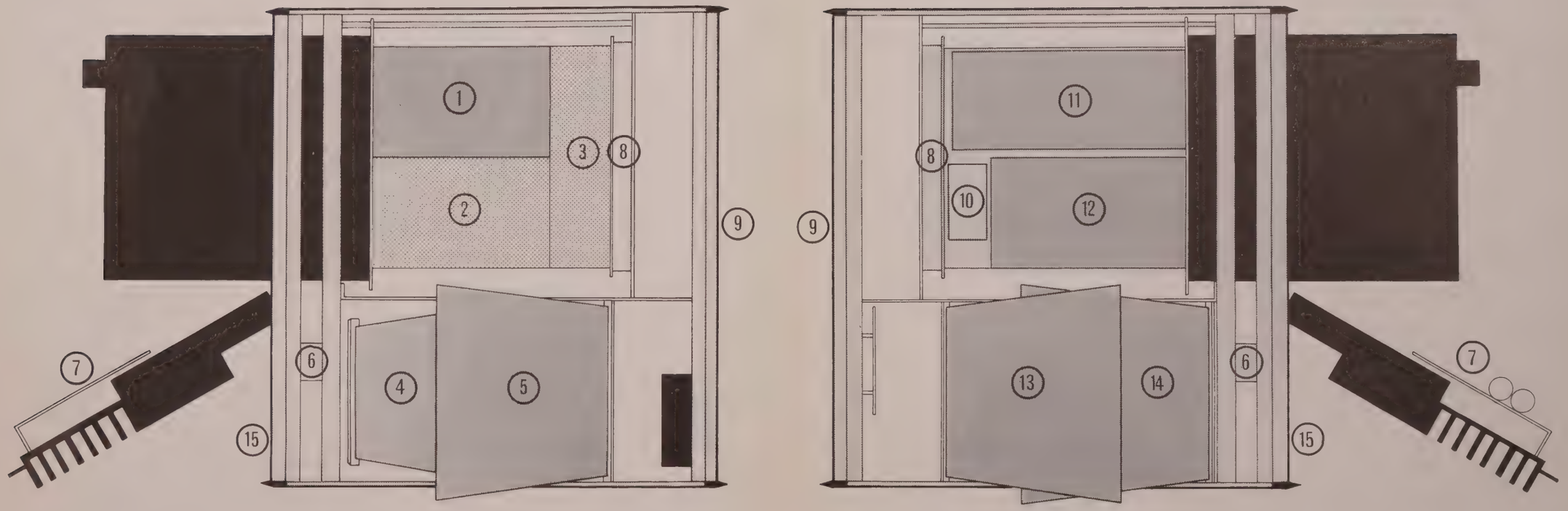



To gain access to the mains switch, fuse, selector and transformer, first remove the mains power cord to ensure no dangerous voltages exist. Then remove the four screws (21) and separate the two halves of the power unit mains section.



# SSG 520

## Location of circuit boards




1. AMPLITUDE MODULATOR AND A.L.C. OUTPUT AMPLIFIER
2. PRESCALER AND PRESCALER BUFFER AMPLIFIER
3. OUTPUT ATTENUATOR
4. F.M. CORRECTION BOARD
5. SYNTHESIZER BOARD
6. CRYSTAL REFERENCE BOARD
7. POWER SUPPLY BOARD
8. R.F. BOX
9. FRONT PANEL
10. STRIPLINE R.F. OSCILLATOR
11. FIRST A.L.C. AMPLIFIER AND RANGE DECODER
12. R.F. OSCILLATOR BOARD
13. RANGE CONTROL AND OUTPUT LEVEL BOARD
14. AUDIO AND SINAD BOARD
15. REAR PANEL

## ROUTINE CALIBRATION TEST EQUIPMENT

| | |
|---|---|
| D V M | D.C. and 400Hz/1kHz frequencies at r.m.s. levels of 1 to 25 volts |
| Power meter | 50Ω with -10 to +10dBm sensitivity in range 10-520MHz |
| Oscilloscope | D.C. and 400Hz/1kHz peak-peak levels/waveforms in range 0.1-25V r.m.s. |
| Modulation meter | A.M. up to 100%, f.m. from 0 to 100kHz in several ranges. Modulation frequency 400Hz/1kHz |
| Distortion analyser | Distortion of 25% at 1kHz. Levels between 0.1V-1V r.m.s. |

| Equipment | Minimum accuracy | Calibration |
|---|---|---|
| D V M | 0.2% | Voltage rails |
| Power meter | 4% | R.F. levels |
| Oscilloscope | 3% | Peak audio levels |
| Modulation meter | 3% | A.M. and f.m. |
| Distortion analyser | 3% | SINAD |

## ROUTINE RECALIBRATION

### 1. VOLTAGE RAILS
*Power supply board (No. 2ZX0832168)*

(i) Monitor the 5V supply across C21 with a DVM and adjust P1 to give an output when fully loaded of 5.2V ±20mV.

(ii) Monitor the 22V supply across C25 with a DVM and adjust P2 to give an output of 22V ±30mV.

### 2. FIRST A.L.C. AMPLIFIER OUTPUT
*Range decoder buffer amp. board (No. 2ZX832169)*

(i) Disconnect the r.f. cables from the amplifier output and monitor the output level with a 50Ω r.f. power meter.

(ii) Set the r.f. to 10MHz.

(iii) Adjust P1 to give an output level of +3dBm.

### 3. PRESCALER BUFFER AMPLIFIER OUTPUT
*Prescaler buffer amp. board (No. 2ZX0832162)*

(i) Break link between amplifier output and prescaler.

(ii) Set the r.f. to 500MHz.

(iii) Adjust P1 to give an output level of 0dBm.

### 4. OUTPUT LEVEL
*Range control board (No. 3ZX0832165 sheet 2)*

(i) Monitor r.f. output on front panel with 50Ω r.f. power meter. Set to 100MHz.

(ii) Set P2 fully c.w.

(iii) Adjust the 'set level' front panel control to centre position. White line on knob should be in 2 o'clock position with potentiometer in centre of mechanical rotation range. Reset control so white line is in 12 o'clock position. (This operation gives more resolution on levels above 0dBm than below).

(iv) Adjust P1 until the r.f. output is 0dBm.

(v) Adjust P3 until the edge meter on front panel reads centre scale.

### 5. 1dB STEPS
*Range control board (No. 3ZX0832165 sheet 2)*

(i) Monitor r.f. output with 50Ω power meter. Ensure a.m. is not being applied.

(ii) Set output frequency to 10MHz. Check the output level is 0dBm with attenuator set to zero - see 5.

(iii) Select -9dBm on attenuator.

(iv) Adjust P4 until output is -9dBm.

### 6. AUDIO OUTPUT LEVEL
*Sinad board (No. 2ZX0832166 sheet 1)*

(i) Monitor internal oscillator output on front panel with oscilloscope

or a.f. voltmeter.

(ii) Set P7 to give a 1V r.m.s. output.

7. AMPLITUDE MODULATION

*Amplitude modulator output amp. board (No. 2ZX0832161)*

(i) Set audio output level - see 7.

(ii) Set output frequency to 100MHz. Using modulation meter set modulation to 100% a.m. at 1kHz.

(iii) Monitor demodulated a.f. output of modulation meter with an oscilloscope and adjust P2 until envelope peaks are just flattening.

(iv) Set to 30% a.m. and monitor demodulated a.f. from modulation meter with a distortion analyser.

(v) Set P1 for minimum distortion.

*Audio board (No. 2ZX0832166 sheet 2)*

(vi) Monitor a.m. depth with a modulation meter and set 50%.

(vii) Set P6 so front panel meter calibration is correct.

8. FREQUENCY MODULATION

*F.M. correction board (No. 1ZX0832167)*

(i) Set audio output level - see 7.

(ii) Set r.f. output to 100MHz.

(iii) Monitor wiper of front panel f.m. level control with an oscilloscope.

(iv) Adjust f.m. level control until oscilloscope shows 10V peak to peak.

(v) Monitor r.f. output with modulation meter. Set P1 to give a deviation of 100kHz.

*Audio board*

(vi) Adjust P1 to calibrate front panel meter.

*F.M. correction board*

(vii) Set f.m. range switch to 3kHz and adjust level control to read 3kHz on front panel meter.

(viii) Adjust P2 to give a true deviation of 3kHz.

9. SINAD

*Sinad board (No. 2ZX0832166 sheet 1)*

(i) Connect the 1kHz audio output on front panel to the SINAD output.

(ii) Monitor test point 2 with an oscilloscope and adjust P1 and P2 to give minimum 1kHz component. The presets will have to be adjusted alternately.

(iii) Inject a known 25% distorted signal into the SINAD output and tune its frequency around 1kHz so SINAD reading is minimised. (An overranged modulation meter a.f. output can be used as a source of predistorted 1kHz).

(iv) Adjust P5 to calibrate meter reading to 12dB SINAD.

RANGE CHANGE POINTS
*Range control board (No. 3ZX0832165 sheet 1)*

Ranges can be held by switching SW1 on control board from 'auto' to 'manual' and setting the control switches to the binary values shown below.

| Range number | Frequency range | Switch setting A | B | C | D |
|---|---|---|---|---|---|
| 1 | 10.0000-14.9999MHz | 1 | 0 | 0 | 0 |
| 2 | 15.0000-21.9999 | 0 | 1 | 0 | 0 |
| 3 | 22.0000-32.9999 | 1 | 1 | 0 | 0 |
| 4 | 33.0000-44.9999 | 0 | 0 | 1 | 0 |
| 5 | 45.0000-61.9999 | 1 | 0 | 1 | 0 |
| 6 | 62.0000-85.9999 | 0 | 1 | 1 | 0 |
| 7 | 86.0000-123.9999 | 1 | 1 | 1 | 0 |
| 8 | 124.0000-175.9999 | 0 | 0 | 0 | 1 |
| 9 | 176.0000-253.9999 | 1 | 0 | 0 | 1 |
| 10 | 254.0000-361.9999 | 0 | 1 | 0 | 1 |
| 11 | 362.0000-520.9999 | 1 | 1 | 0 | 1 |

# RECALIBRATION OF FREQUENCY

## Adjusting the internal crystal reference

*Note: This adjustment should not be attempted without a suitable frequency standard.*

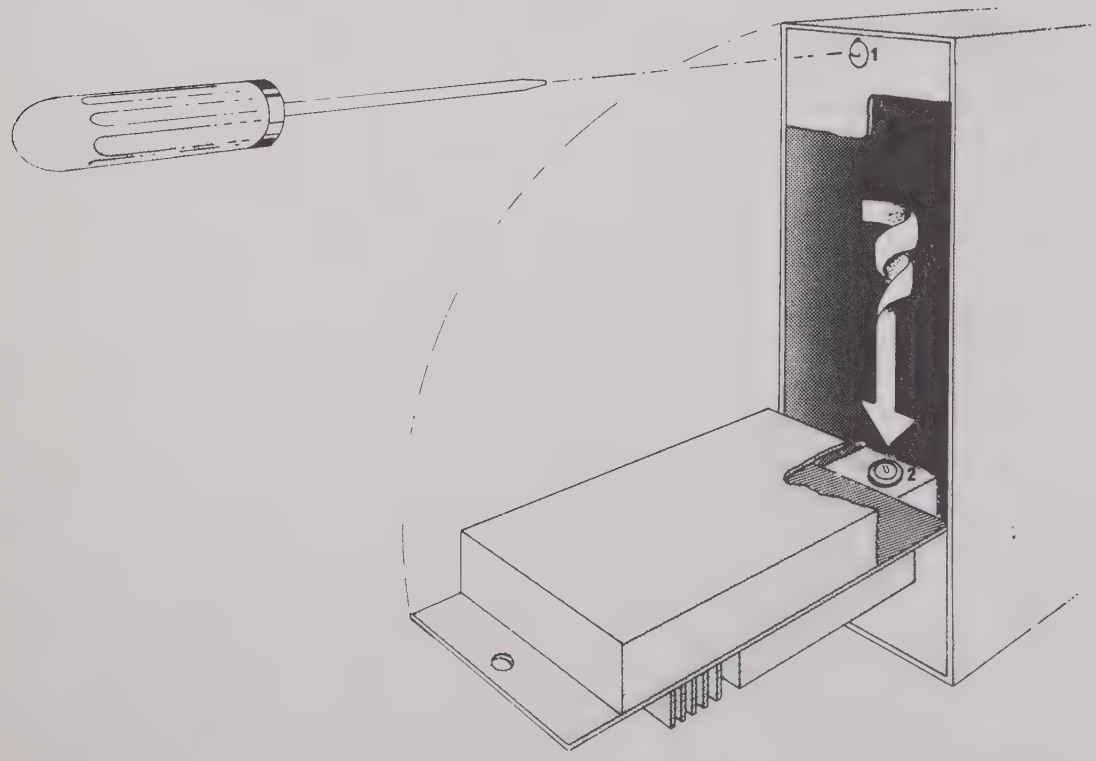
Stand the instrument up on the left hand side (viewed from the front). Turn the quick release (1) at the end of the PSU assembly on rear panel by half a turn. Gently lower PSU assembly down on the hinge.

### Standard crystal reference

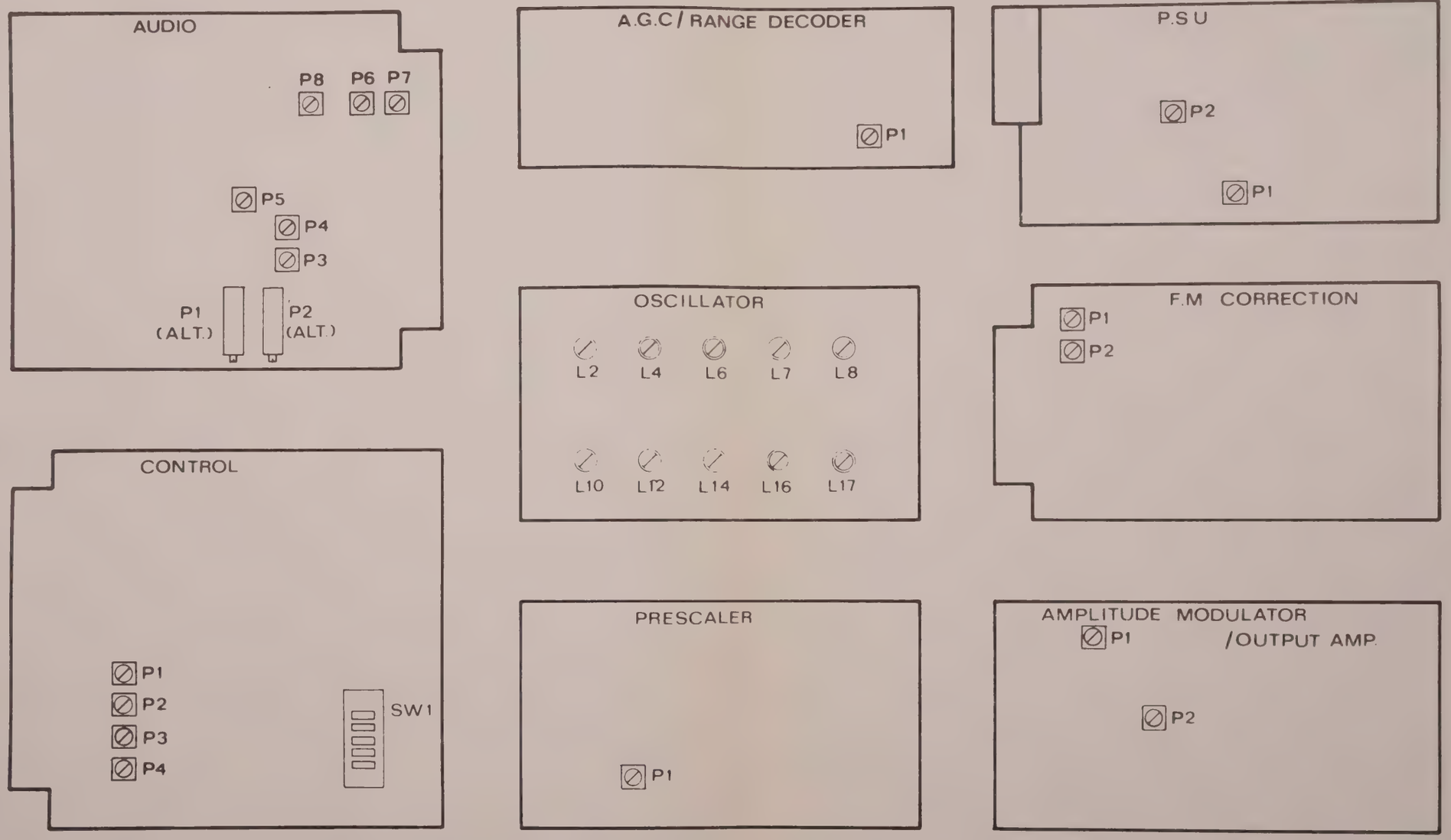
Using an appropriate small screwdriver (preferably non-metallic) adjust the crystal frequency control (2) whilst monitoring either the synthesizer output or the crystal reference output with a suitable frequency standard. The reading should correspond either to the thumbwheel settings (synthesizer output) or the crystal reference output specified at the rear panel socket, respectively.

### Option A units

Option A units are fitted with separate coarse (capacitor) and fine (potentiometer) adjustments (2) and (3) respectively. Using a small screwdriver, adjust the multi-turn potentiometer (3) whilst monitoring against an external frequency standard as above. If the potentiometer runs out of range then reset it to the mid-point of its track and remove the dust plug from the oven unit (2). Use a small screwdriver (preferably non-metallic) to adjust the coarse frequency control (2) as above. Replace the dust plug and fine tune (3).



DRAWING No
3ZV0832276

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NOTES

FARNELL INSTRUMENS LTD. WETHERBY, YORKS

CALIBRATION POINTS

SSG520

DRAWING No.
3ZV0832276
Section 17 issue 1 11·78

## FAULTFINDING

This section will not be available until mid-1979

If the unit should fail during its first 12 months of operation we will repair it under the terms of our guarantee.

Please do not hesitate to contact our Service Department for advice when attempting out of guarantee repairs.

If you would like the FAULTFINDING section sent to you when it becomes available please complete the form below and return it to us. This will ensure that we send the information to the person using the instrument rather than to your general company address. Thank you.

## Remote programming (Option B)

A 50 way rear panel socket enables remote control of the output frequency, attenuation, modulation on/off and SINAD meter reading. The frequency steps 10kHz to 100MHz are CMOS level, the 100Hz and 1kHz steps being ECL. 10dB steps are selected by driving with +24V and the 1dB steps resistor programmed.

A.M. and/or f.m. can be selected by a contact closure to a common line and the SINAD meter output is available as an analogue level. Other outputs are the r.f. lock indication, underrange and overrange, and the SINAD input a.g.c. within-range indication.

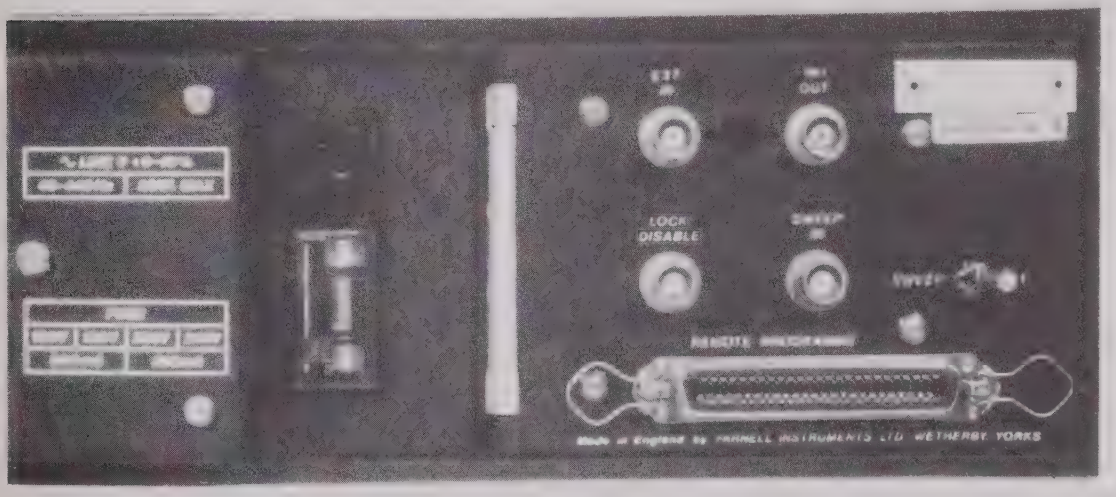
Voltages of +5, $\pm$ 15 and +24 are also available for programme use. These supplies must not be used to drive external circuits.

Before programming, ensure that the thumbwheel switches and attenuator step-switches are all set to zero. Also that the two modulation internal/external select switches on front panel are set to the central off position after setting up the required modulation depth/deviation.

Under no circumstances must voltage levels exceeding those specified be applied. Internal circuit damage may result.

Changing frequency remotely will not instigate an f.m. calibration. This can be done at any time after a new frequency has been demanded.

Apart from automatic test routines originated by computers/calculators, the programme facility of the SSG520 enables the hard-wiring of regularly used frequency channels and mute/squelch levels to a multi-switch, thus giving very convenient resetting of these parameters.



**Programme socket identification**

| LEVEL | FUNCTION | | PIN No. | | FUNCTION | | LEVEL |
|---|---|---|---|---|---|---|---|
| | Mod select common | | 1 | 26 | SINAD AGC in | | +15V = AGC in |
| 0 to 1V approx. | SINAD meter reading | | 2 | 27 | N.C. | | |
| +15V = out of lock | Lock indication | | 3 | 28 | F.M. | | Cal CMOS. OV= Cal |
| Short to pin 1 | AM select | | 4 | 29 | FM select | | Short to pin 1 |
| +15V = u/r | Underrange | | 5 | 30 | Overrange | | +15V = o/r |
| | N.C. | | 6 | 31 | −15V | | |
| | +5V | | 7 | 32 | OV | | |
| | +24V | | 8 | 33 | +15V | | |
| ECL + 5V = '1' | '2' | 100'sHz | 9 | 34 | 100'sHz | '1' | ECL + 5V = '1' |
| " | '4' | 100'sHz | 10 | 35 | 100'sHz | '8' | " |
| " | '2' | kHz | 11 | 36 | kHz | '1' | " |
| " | '4' | kHz | 12 | 37 | kHz | '8' | " |
| CMOS +15V = '1' | '2' | 10'skHz | 13 | 38 | 10'skHz | '1' | CMOS +15V = '1' |
| " | '4' | 10'skHz | 14 | 39 | 10'skHz | '8' | " |
| " | '2' | 100'skHz | 15 | 40 | 100'skHz | '1' | " |
| " | '4' | 100'skHz | 16 | 41 | 100'skHz | '8' | " |
| " | '2' | MHz | 17 | 42 | MHz | '1' | " |
| " | '4' | MHz | 18 | 43 | MHz | '8' | " |
| " | '2' | 10'sMHz | 19 | 44 | 10'sMHz | '1' | " |
| " | '4' | 10'sMHz | 20 | 45 | 10'sMHz | '8' | " |
| " | '2' | 100'sMHz | 21 | 46 | 100'sMHz | '1' | " |
| " | '4' | 100'sMHz | 22 | 47 | N.C. | | |
| Resistor programme to pin 48 | | 1dB | 23 | 48 | 1dB | | Resistor programme to pin 23 |
| Take to +24V | '2' | 10dB | 24 | 49 | 10dB | '1' | Take to +24V |
| " | '4' | 10dB | 25 | 50 | 10dB | '8' | " |

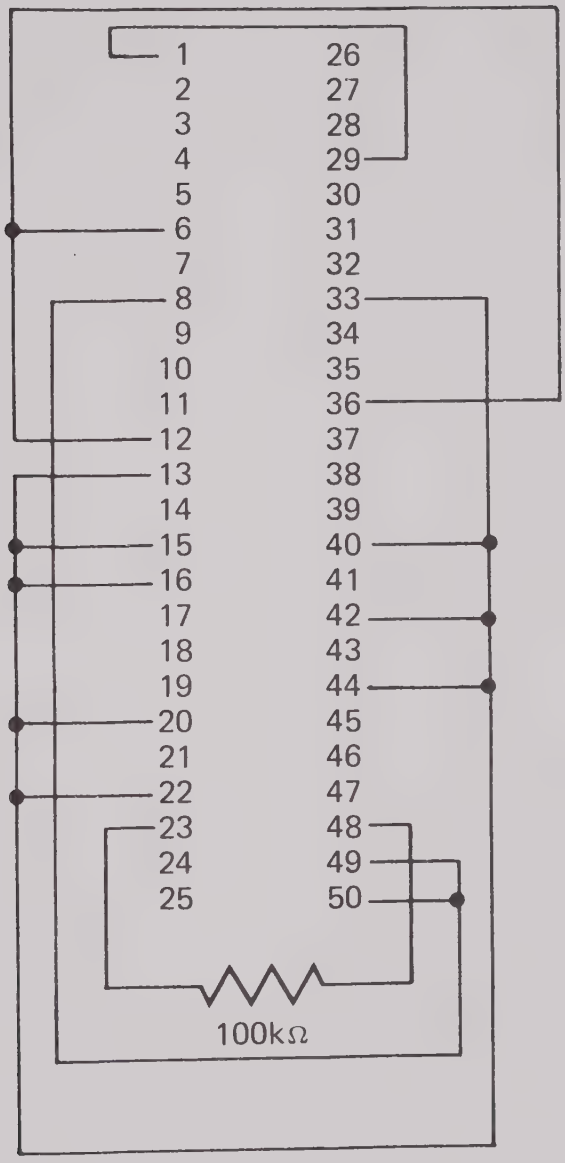
Programme plug type Amphenol 57–30500 50 way

**1dB attenuator programme resistors**

| dB | Required resistance | Convenient standard values |
|---|---|---|
| 1 | 820k | 820k |
| 2 | 386k | 470k/2M2 |
| 3 | 242k | 270k/2M7 |
| 4 | 171k | 220k/820k |
| 5 | 128k | 150k/1M |
| 6 | 100k | 100k |
| 7 | 80.8k | 82k |
| 8 | 66.2k | 68k |
| 9 | 55k | 56k |

**Programme example**

| | |
|---|---|
| Frequency | 451.7250 MHz |
| Output level | −96dBm |
| Modulation | FM-on, AM-off |



## REVERSE POWER PROTECTION (OPTION D)

This circuit is completely enclosed in a metal box behind the front panel. It is fitted in the solid coaxial output line and sealed to prevent r.f. leakage. Any fault developing in this unit is best rectified therefore by complete unit replacement. In an emergency, however, the box lid can be carefully unsoldered and components replaced. It is very important to replace all the components in exactly the same position as the original ones before resoldering on the lid.

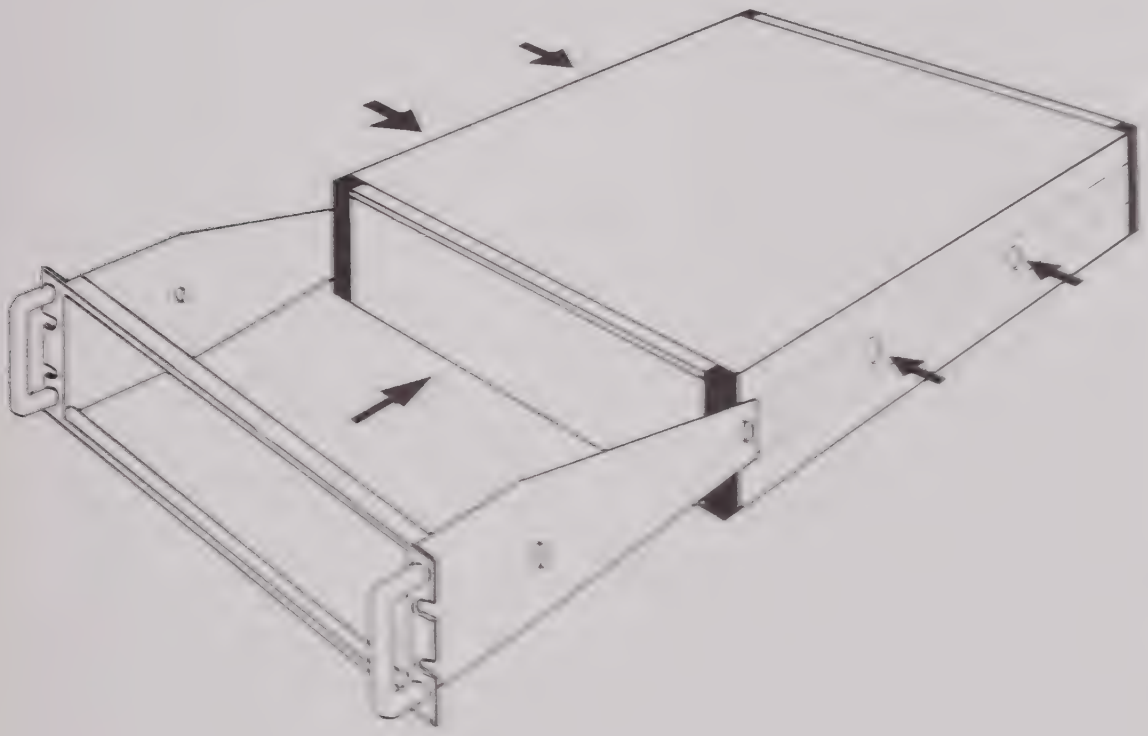
To remove the reverse power protection box, first remove the front panel (see instrument dismantling instructions). Then remove the large nut securing the type 'N' output connector to the front panel. Remove the clip securing the solid coaxial output line to the attenuator switch assembly and remove the supply line wire from the feedthrough connection on the reverse power box.

The complete output coaxial line and box assembly can then be removed from the front panel.

## RACK MOUNTING (OPTION E)

This consists of two side plates linked by two bars. The assembly fits around the instrument front panel without any modification.

To fit, remove the two large screws in each side handle and push the rack assembly over the front panel until the side plate holes align with the chassis holes. Fix the side plates by replacing the four screws.

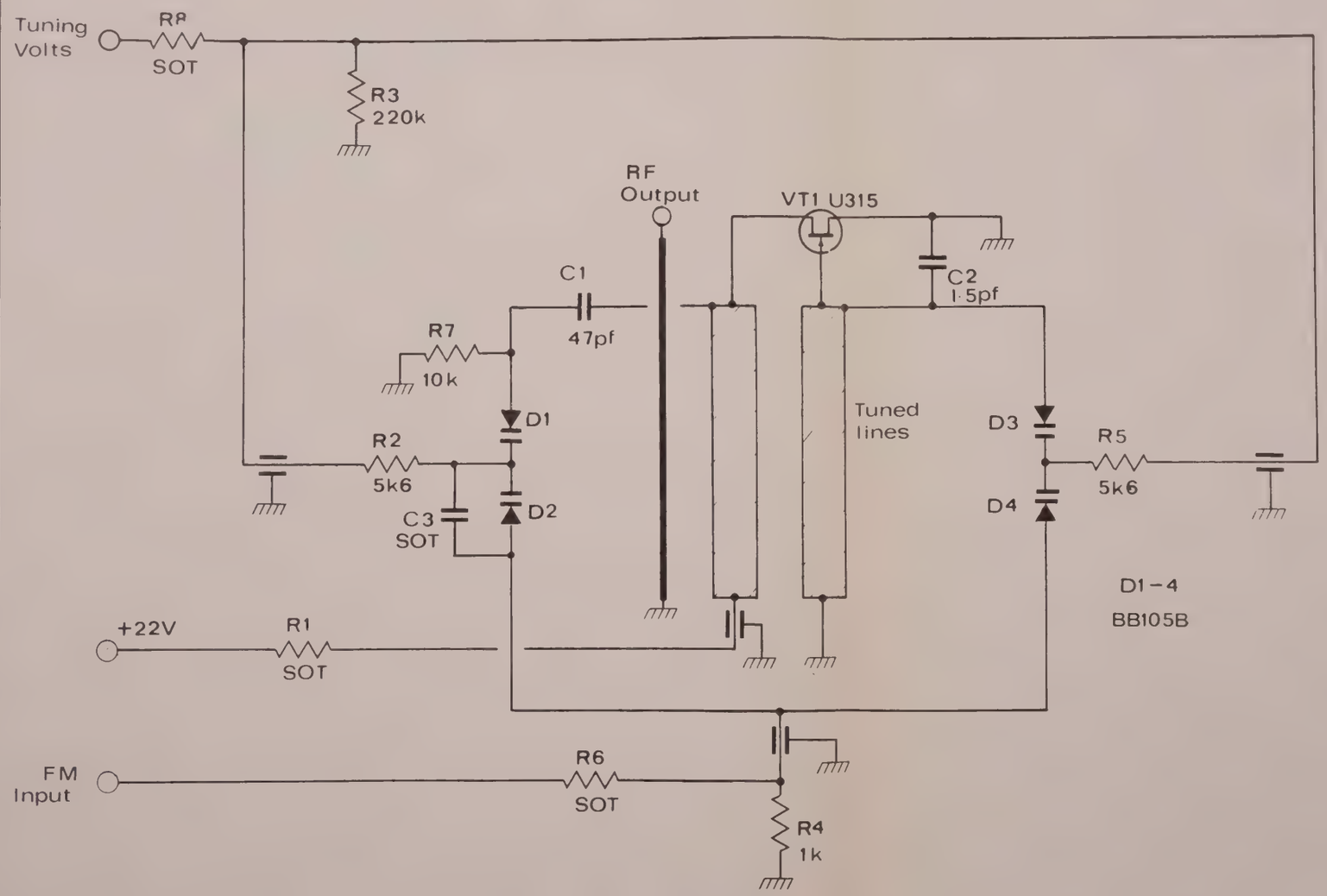


## MODEL CHANGES

Unless specially modified the following model changes were effected at and including the specified serial number.

| | |
|---|---|
| 8320176 - 3 | 2MHz external reference changed to 1MHz |
| 8320206 - 4 | Option A frequency adjustment has extra fine potentiometer control |
| 8320232 - 5 | 'Carrier off' switch added concentric with r.f. 'set level' control |
| 8320176 - 3 | Stripline oscillator 'hard start' circuit added. |

| DRAWING No | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3SZ0832170 | R | 8 | 1 | 3 2 | 7 | 6 | 4 | 5 |
| | C | | | | | 1 | | 2 |
| | VT | | | | | | 1 | |
| | MISC | | | D1,2 | | | | D3,4 |




| TRACED | | | | | | |
|---|---|---|---|---|---|---|
| CHECKED S.D. | C | 6.4.78 | 4574@ | | | |
| | B | 7·12·77 | Q4409P | | | |
| DRAWN J.N. | ISS | DATE | MOD No | | | |
| | A | 14.10.77 | — | | | |

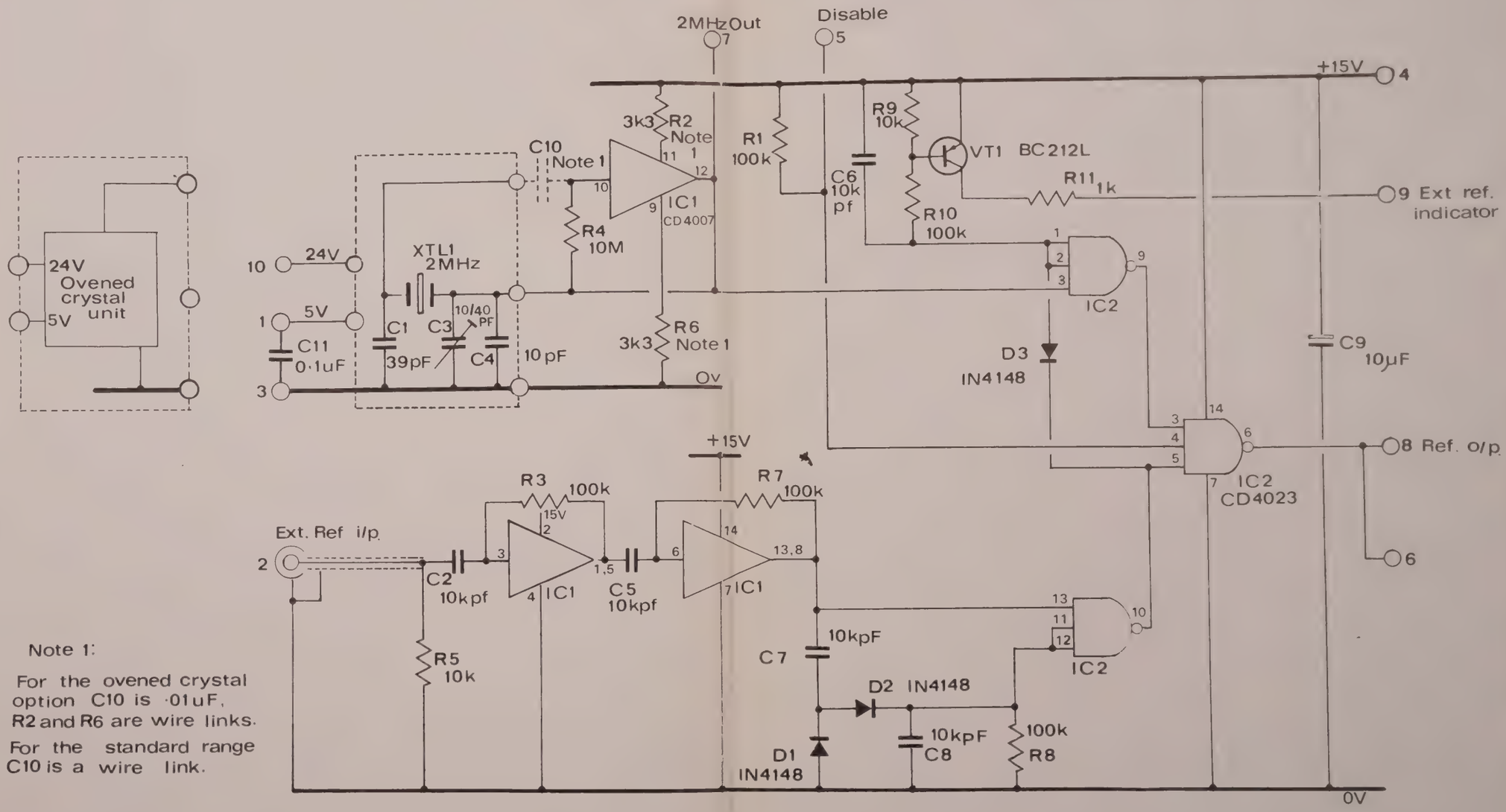
FARNELL INSTRUMENTS LTD. WETHERBY.

TITLE STRIP LINE OSCILLATOR SSG520 Section 19 issue 1 11·78

DRAWING No 3SZ0832170

SHEET OF SHEETS

| DRAWING No. 3ZX0832164 | R | 5 | 3 4 | 2,6 | 7 1 | 9 10 | 8 | 11 | | R |
|---|---|---|---|---|---|---|---|---|---|---|
| | C | 1 | 2 3 4 10 | 5 | | 7 6 8 | | | 9 | C |
| | VT | | | | | | 1 | | | VT |
| USED ON | MISC | XTL1 | IC1 | IC1 | IC1 | D1 D2 | | D3 IC2 | IC2 | MISC |

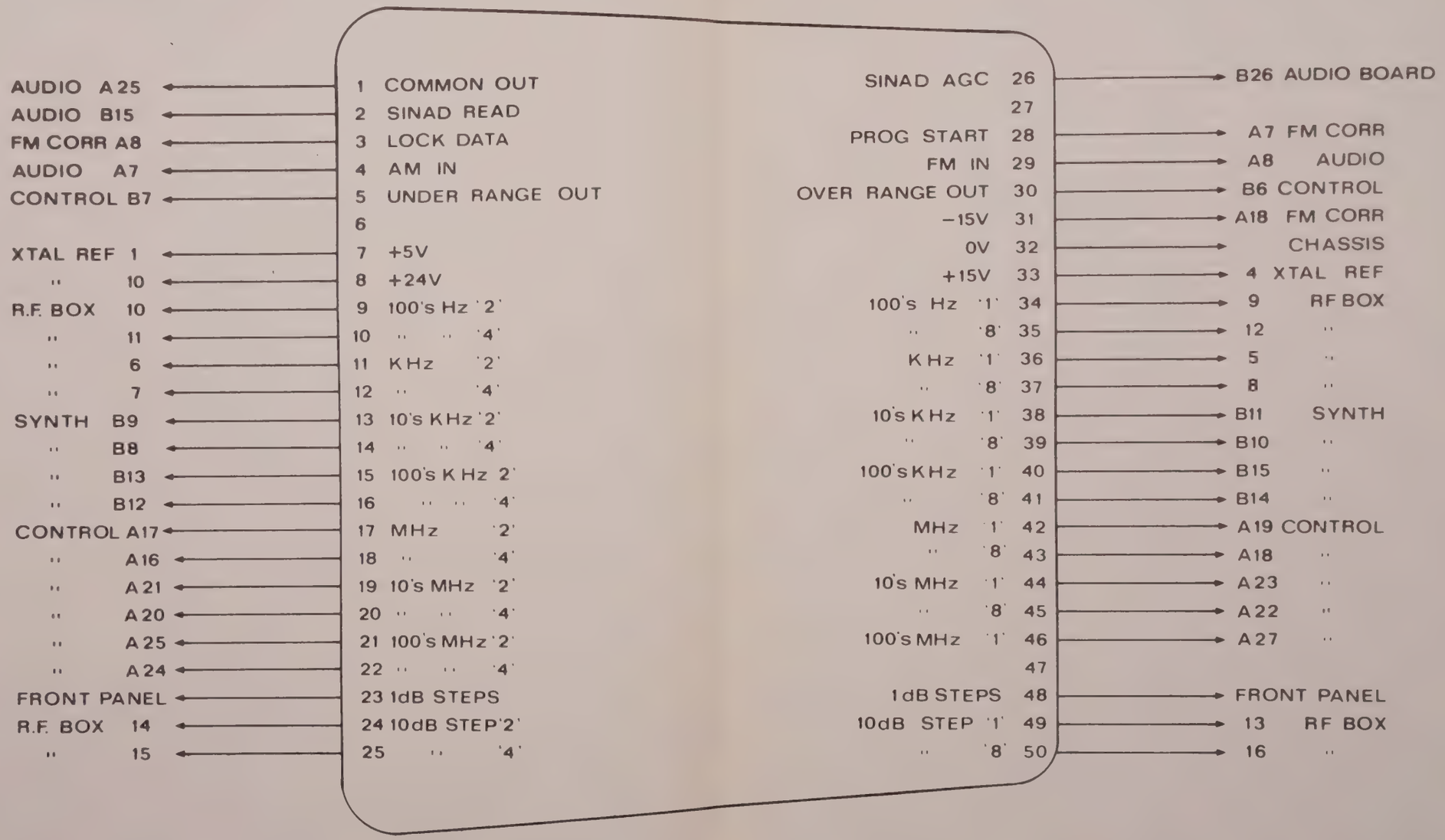



Note 1:

For the ovened crystal option C10 is ·01uF, R2 and R6 are wire links.

For the standard range C10 is a wire link.

| TRACED | | | | | | | | TOLERANCES | PROTECTIVE FINISH | NOTE: REMOVE ALL BURRS AND SHARP EDGES | FARNELL INSTRUMENTS LTD. WETHERBY. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CHECKED B 13/10/11 | C | 20.6.78 | Q4745 | | | | | MATERIAL | | | TITLE: REF. OSCILLATOR BOARD Section 19 issue 1 11·78 SSG520 | DRAWING No. 3ZX0832164 |
| DRAWN J.N. | B | 8.12.77. | Q4456P | | | | | | | | | |
| | ISS | DATE | MOD NO. | | | | | SCALE | DIMENSIONS IN MM | | | SHEET 1 OF 1 SHEETS |
| | A | 23.8.77 | | | | | | | | | | |




| TRACED | ISS. | DATE | MOD. No. | ISS. | DATE | MOD. No. |
|---|---|---|---|---|---|---|
| | A | 22.8.78 | | | | |
| CHECKED | B | 8-11-78 | Q5047 | | | |
| DRAWN A.M. | | | | | | |

USED ON: F832

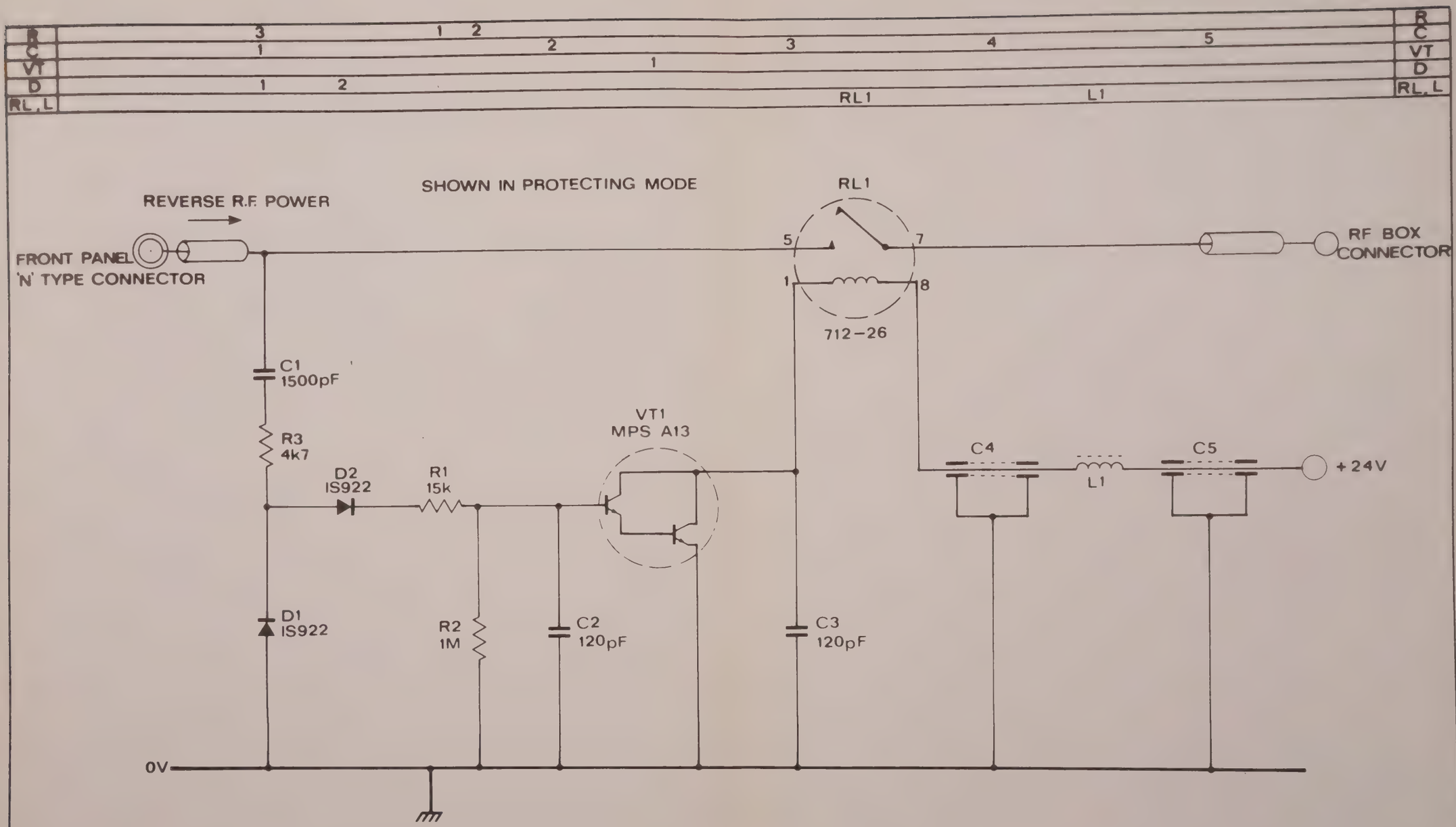
NOTE:
CAPACITOR VALUES GIVEN IN µF.
RESISTOR VALUES IN Ω
UNLESS OTHERWISE STATED.

FARNELL INSTRUMENTS LTD. WETHERBY, YORKS.

TITLE
PROGRAMME SOCKET
WIRING DIAGRAM
Section 19 issue 1 11-78

DRAWING No
2ZV0832284

SHEET 1 OF 1 SHEETS




| TRACED | ISS. | DATE | MOD. No. | ISS. | DATE | MOD. No. | USED ON: |
|---|---|---|---|---|---|---|---|
| | A | 4.10.78 | | | | | |
| CHECKED | B | 8.11.78 | Q5077 | | | | |
| DRAWN SM | | | | | | | |

NOTE:
CAPACITOR VALUES GIVEN IN µF.
RESISTOR VALUES IN Ω
UNLESS OTHERWISE STATED.

FARNELL INSTRUMENTS LTD. WETHERBY, YORKS.

TITLE REVERSE POWER PROTECTION
OPTION D SSG 520
Section 19 issue 1 11·78

DRAWING No 3ZX0832285

SHEET 1 OF 1 SHEETS

# UNIT KEY — FARNELL INSTRUMENTS LTD.

| INSTRUMENT | DRAWN | DATE | F. No. | SHT | OF | |
|---|---|---|---|---|---|---|
| SSG520 | C.L.W. | 3/3/78 | 832 | 1 | 7 | UK 832 |

| DRAWING No. | SHT. | ISS. | DESCRIPTION | QTY. |
|---|---|---|---|---|
| | | | R.F. BOX. F832 RF | |
| 4ML0832008 | | G | R.F. BOX FINAL ASSY. | |
| 4ML0832009 | 1 | E | R.F. BOX ASSY. | |
| 4ML0832010 | 1 | D | R.F. BOX CENTRE PLATE | |
| 4ML0832011 | 1 | F | STRIP LINE OSC. ASSY. | |
| 4ML0832012 | | | ATTENUATOR ASSY. | |
| 4ML0832013 | 1<br>2 | B<br>B | VARACTOR OSC. C.B. | |
| 4ML0832014 | 1 | B | A.M. MOD - O/P AMP C.B. | |
| 4ML0832015 | | E | AGC/RANGE DEC. C.B. | |
| 4ML0832016 | 1 | B<br>D | PRESCALER C.B. | |
| 4ML0832025 | 1 | G | CASING | |
| | | | POWER SUPPLY F832PS | |
| 4ML0832005 | 1<br>2 | G<br>C | POWER SUPPLY ASSY. | |
| 4ML0832022 | | | POWER SUPPLY C.B. | |
| | | | MAIN FRAME F832MF | |
| 4ML0832003 | | | BACK PANEL ASSY. | |
| 4ML0832004 | 1<br>2 | D<br>D | CHASSIS ASSY. | |
| 4ML0832017 | 3<br>2 | B<br>B | SYNTHESIZER C.B. | |
| 4ML0832018 | | | 2MHz REF. OSC. C.B. | |
| 4ML0832019 | | | CONTROL C.B. | |
| 4ML0832020 | | | AUDIO C.B. | |
| 4ML0832021 | A<br>2 | D<br>D | F.M. CORRECTION C.B. | |
| 4ML0832023 | | | WIRE PREP. | |
| | | | FRONT PANEL F832FP | |
| 4ML0832002 | 3 | G | FRONT PANEL ASSY. | |
| | | | FINAL ASSY. F832 | |
| 4ML0832001 | | C | FINAL ASSY. | |

| DRAWING No. | SHT. | ISS. | DESCRIPTION | QTY. |
|---|---|---|---|---|
| | | | PROGRAMMABLE OPTION F832 B | |
| 4ML0832024 | | | WIRE PREP. | |
| | | | RACK MOUNTING OPTION F832 E | |
| 4ML0832026 | | | RACK MOUNTING OPTION | |
| | | | REVERSE POWER PROTECTION OPTION F832 D | |
| 4ML0832027 | 1 | C | R. POWER PROT. | |

| ISSUE | A | [illegible] | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DATE | | [illegible] | Q4693 | 20.6.78 | 28 July '78 | 13-9-78 | 3-10-78 | 20.10.78 | [illegible] | 3-11-78 | 18-11-78 |
| MOD. No | ~ | [illegible] | | Q4745 | 4877 | Q4931 | Q496-2 | Q5023 | [illegible] | 5047 | Q5099 |

| ISSUE | [illegible] | M | N | | P | Q | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DATE | [illegible] | [illegible] | 3-2-79 | | [illegible] | 5/4/79 | | | | | |
| MOD. No | [illegible] | [illegible] | Q5321 | | Q5417 | Q5350 | | | | | |

# UNIT KEY

## FARNELL INSTRUMENTS LTD.

| INSTRUMENT | DRAWN | DATE | F. No. | SHT | OF | |
|---|---|---|---|---|---|---|
| SSG520 | J.L.M | 8·12·77 | 0832 | 2 | 7 | UK0832 |

| DRAWING No. | SHT. | ISS. | DESCRIPTION | QTY. | DRAWING No. | SHT. | ISS. | DESCRIPTION | QTY. |
|---|---|---|---|---|---|---|---|---|---|
| 2CJ0832204 | 1 | A | STRIP LINE OSC. PtA | 1 | | | | | |
| 3000832205 | 1 | A | STRIP LINE OSC. PtB | 1 | | | | | |
| 4000832206 | 1 | P1 | STRIP LINE OSC. PtC | 1 | | | | | |
| 4000832207 | 1 | P1 | STRIP LINE OSC. PtD | 1 | | | | | |
| 4BB0832208 | 1 | P1 | STRIP LINE OSC. PtE | 1 | | | | | |
| 3CB0832214 | 1 | A | L.H. BRACKET R.F. BOX | 1 | | | | | |
| 3CB0832215 | 1 | P4 | R.H. BRACKET R.F. BOX | 1 | | | | | |
| 3CJ0832228 | 1 | P2 | PRESCALER BOX LID | 1 | | | | | |
| 1BA0832232 | 1 | C | R.F. BOX CENTRE PLATE | 1 | | | | | |
| 3CJ0832236 | 1 | P3 | PRESCALER BOX | 1 | | | | | |
| 4000832245 | 1 | P1 | INSULATOR ROD | 2 | | | | | |
| 4CJ0832231 | 1 | P1 | FEEDTHROUGH WASHER | 14 | | | | | |
| 2CN0832192 | 1 | P4 | R.H. SIDE COVER | 1 | | | | | |
| 2CN0832193 | 1 | P4 | L.H. SIDE COVER | 1 | | | | | |
| 3CB0832203 | 1 | P3 | L.H & R.H BRACKETS | 1EA | | | | | |
| 4CB0832250 | 1 | A | COVER SPACER | 4 | | | | | |
| 4CB0832229 | 1 | A | P/S SECUR. BRACKEY | 1 | | | | | |
| 4CB0832217 | 1 | P4 | PUSH ROD SUPPORT | 1 | | | | | |
| 4CJ0832249 | 1 | P1 | MODULATOR SCRN. BOX | 1 | | | | | |

| ISSUE | P1 | P2 | A | B | C | D | E | F | | H |
|---|---|---|---|---|---|---|---|---|---|---|
| DATE | 8·12·77 | 15-3-78 | 17/4/78 | 15-7-78 | 31/7/78 | 1/8/78 | 13-9-78 | 16-11-78 | | 21·2·79 |
| MOD. No | | Q4621 | Q4660 | Q4603 | Q4877 | Q4850 | Q4931 | Q5115 | | Q5356 |
| ISSUE | | | | | | | | | | |
| DATE | | | | | | | | | | |
| MOD. No | | | | | | | | | | |

# UNIT KEY — FARNELL INSTRUMENTS LTD.

| INSTRUMENT | DRAWN | DATE | F. No. | SHT | UK |
|---|---|---|---|---|---|
| SSG520 | JC | 21-3-78 | 0832 | 3 OF 7 | UK 0832 |

| DRAWING No. | SHT. | ISS. | DESCRIPTION | QTY. |
|---|---|---|---|---|
| | | | MAIN FRAME | |
| 3AE0832235 | 1 | B | BACK PANEL | 1 |
| 4000832240 | 1 | P1 | INSULATING PLATE | 1 |
| 4000832241 | 1 | P1 | HINGE MODIFICATION | 1 |
| 4AE0832243 | 1 | P1 | CONNECTOR COVER | 1 |
| 3AE0832194 | 1 | P5 | BOTTOM BAR REAR | 1 |
| 2000832195 | 1 | P2 | FILLER EXTRUSION | 2 |
| 2BA0832196 | 1 | A | C.B. CENTRE PLATE | 1 |
| 3BA0832198 | 1 | P1 | C.B. FIXING BRACKET | 2 |
| 3BA0832199 | 1 | P2 | CENTRE BAR | 2 |
| 3BA0832200 | 1 | A | C.B. FIXING BRACKET | 1 |
| 3BA0832201 | 1 | P2 | GUIDE SUPPORT | 1 |
| 3000832202 | 1 | P4 | TOP & BOTTOM TRIM | 4 |
| 2BA0832216 | 1 | B | CENTRE PLATE | 1 |
| 2000832225 | 1 | P2 | L & R.H. SIDE TRIM | 2 |
| 4AE0832230 | 1 | P2 | FALSE HANDLE STRAP | 4 |
| 1000832233 | 1 | P2 | TOP COVER | 1 |
| 1000832234 | 1 | P3 | BOTTOM COVER | 1 |
| 3AE0832242 | 1 | P2 | FOOT MODIFICATION | 2 |
| 3AE0832246 | 1 | P5 | TOP REAR BAR | 1 |
| 4BA0832218 | 1 | A | HINGE BRACKET | 2 |
| | | | FRONT PANEL | |
| 1BA0832191 | 1 | A | FALSE FRONT PANEL | 1 |
| 3AE0832209 | 1 | A | ATTEN. SWITCH PLATE | 1 |
| 4BA0832212 | 1 | P3 | MAINS PUSH PLATE | 1 |
| 4BA0832247 | 1 | A | TWIN POT MTG. BKT. | 1 |
| 4BA0832252 | 1 | C | SWITCH MTG. PLATE | 3 |
| 4000832258 | 1 | P1 | BNC INSULATING WASHER | 3 |

| DRAWING No. | SHT. | ISS. | DESCRIPTION | QTY. |
|---|---|---|---|---|
| | | | POWER SUPPLY | |
| 4AE0832179 | 1 | P3 | HEAT SINK BRACKET | 1 |
| 3AE0832182 | 1 | P2 | NO 1 BRACKET | 1 |
| 4AE0832183 | 1 | P3 | " 2 " | 1 |
| 4AE0832184 | 1 | P9 | " 3 " | 1 |
| 3AE0832185 | 1 | P6 | " 4 " | 1 |
| 3AE0832186 | 1 | P8 | " 5 " | 1 |
| 3AE0832187 | 1 | P12 | " 6 " | 1 |
| 3CH0832188 | 1 | A | NO 7 HEATSINK | 1 |
| 4AE0832313 | 1 | A | BACK SUPPORT | 1 |
| | | | RACK MOUNTING KIT | |
| 2AG0832221 | B | 1 | RACK MTING SIDE | 2 |
| 3AG0832222 | P1 | 1 | " " BARS | 2 |

NOTE: RACK MOUNTING KIT IS AN OPTIONAL EXTRA AND SHOULD ONLY BE MADE ON INSTRUCTIONS FROM PRODUCTION CONTROL

| ISSUE | P1 | P2 | P3 | P4 | P5 | P6 | A | B | C | D | E |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DATE | 9-12-77 | 16-2-78 | 15-3-78 | 21-3-78 | 23.5.78 | 20.6.78 | 4/8/78 | 14/9/78 | 20-10-78 | 8-11-78 | 25-11-78 |
| MOD. No | | 4562P | Q4621 | Q4625 | Q4693 | Q4744 | Q4877 | Q4893 | Q5023 | Q5047 Q5067 | Q5108 |

| ISSUE | F | G | H | I |
|---|---|---|---|---|
| DATE | 7-12-78 | 20-12-78 | 5/2/79 | 21.3.79 |
| MOD. No | Q5124 | Q5157 | Q5346 | Q5419 |

UNIT KEY — FARNELL INSTRUMENTS LTD.

| INSTRUMENT | DRAWN | DATE | F No | SHT | OF | |
|---|---|---|---|---|---|---|
| SSG520 | J.L.M | 8·12·77 | 0832 | 4 | 7 | UK0832 |

| DRAWING No. | SHT | ISS | DESCRIPTION | QTY |
|---|---|---|---|---|
| 1CN0832180 | 1 | F | R.F. BOX LID | 1 |
| 1CN0832181 | 1 | D | R.F. BOX. | 1 |
| 4000832253 | 1 | A | SERIAL NOS. LABEL | 1 |
| 2AL0832190 | 1 | P6 | FRONT PANEL | 1 |
| 4AE0832210 | 1 | P4 | ATTEN. SWITCH DISC | 2 |
| 4000832248 | 1 | A | DISC. ENGRAVG. DETAIL | 2 |
| 3000832211 | 1 | P1 | PERSPEX WINDOW | 1 |
| 3000832226 | 1 | A | END MOULDING MOD. | 2 |
| 3CB0832213 | 1 | A | MAINS PUSH ROD | 1 |
| 3CB0832227 | 1 | A | GUIDER RAILS | 2 |
| 3BA0832219 | 1 | P2 | CONNECTOR SUPPORT | 3 |
| 3BA0832220 | 1 | P1 | CONNECTOR SUPPORT | 1 |
| 4AG0832223 | 1 | P1 | HANDLE COVER | 4 |
| 4SU000461 | 1 | | STABILIZING PLATE | 8 |
| 4000832261 | 1 | P1 | FALSE HANDLE | 4 |
| 4SUCF0486 | 1 | C | EARTH TAG | 1 |
| 2000832261 | 1 | B | ATTENUATOR MECH. ASSY. | 1 |
| * NOTE: ATTENUATOR MECH. ASSY. ABOVE IS A "BOUGHT IN" FINISHED SUB ASSEMBLY MADE UP FROM THE FOLLOWING PARTS:- | | | | |
| 4CJ0832238 | 1 | P2 | ATTENUATOR DIVISION "A" | 4 |
| 4CJ0832254 | 1 | A | " " "B" | 1 |
| 4CJ0832255 | 1 | P2 | " " "C" | 2 |
| 4CJ0832256 | 1 | P2 | " " "D" | 2 |
| 2CJ0832237 | 1 | A | ATTENUATOR BASE PLATE | 1 |
| 4CJ0832239 | 1 | P1 | THREADED BUSH | 6 |

| DRAWING No | SHT | ISS | DESCRIPTION | QTY |
|---|---|---|---|---|
| 4ZP0832150 | | | THUMBWHEEL SWITCH | 1 |
| 3Z00832151 | 1 | D | METER SPEC | 1 |
| 4ZP0832152 | 1 | E | ATTEN. SWITCH SPEC. 1 | 1 |
| 4ZP0832153 | 1 | D | ATTEN. SWITCH SPEC 2 | 1 |
| 4ZP0832154 | 1 | B | F.M. RANGE SWITCH SPEC | 1 |
| 4ZP0832155 | 1 | B | METER FN. SWITCH SPEC. | 1 |
| 2000832257 | | | R.F. O/P COAX ASSY | 1 |
| 4000832259 | | | R.F. BOX OUTER GASKET | 1 |
| 4000832260 | | | R.F. BOX INNER GASKET | 1 |
| 3CJ0832262 | 1 | A | REVERSE POWER PROTECTION / BASE PLATE | 1 |
| 4CJ0832263 | 1 | A | — / DIVIDER A | 1 |
| 4CJ0832264 | 1 | A | — / DIVIDER B | 1 |
| 4CJ0832265 | 1 | B | — / END PLATE 'A' | 1 |
| 4CJ0832266 | 1 | B | — / END PLATE B | 1 |
| 4CJ0832267 | 1 | A | — / COVER | 1 |

| ISSUE | P1 | P2 | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DATE | 9·12·77 | 7·3·78 | 17/4/78 | 20-4-78 | 27/4/78 | 24.5.78 | 20.6.78 | 3/8/78 | 13-9-78 | 18/9/78 | 19/10/78 |
| MOD. No | | | Q4660 | Q4647 | Q4670 | Q4693 | Q4745 | Q4877 | Q4931 | Q4893 | Q5023 |

| ISSUE | J | K | L | M | N | O | P | Q |
|---|---|---|---|---|---|---|---|---|
| DATE | 8-11-78 | 16-11-78 | 19/12/78 | 20/12/78 | 14·2·79 | 31.3.79 | 31.3.79 | 5/4/79 |
| MOD. No | Q5067 | 5095 | Q5173 | Q5203 | Q5286 | Q5451 | Q5418 | Q5350 |

MATERIAL LISTS.

# UNIT KEY — FARNELL INSTRUMENTS LTD.

| INSTRUMENT | DRAWN | DATE | F. No. | SHT | UK |
|---|---|---|---|---|---|
| SSG 520. | PE. PEDLEY | | 832 | 5 OF 7 | 832 |

| DRAWING No. | SHT. | ISS. | DESCRIPTION | QTY. | DRAWING No. | SHT. | ISS. | DESCRIPTION | QTY |
|---|---|---|---|---|---|---|---|---|---|
| 4ML0832001 | 1 | | FINAL ASSY. | 1 | 4ML0832020 | 3 | B | AUDIO CB | 1 |
| 4ML0832002 | 1 | E | FRONT PANEL ASSY. | 1 | 4ML0832020 | 4 | | " " | 1 |
| 4ML0832002 | 2 | H | " " " | 1 | 4ML0832020 | 5 | | " " | 1 |
| 4ML0832002 | 3 | E | " " " | 1 | 4ML0832020 | 6 | | " " | 1 |
| 4ML0832003 | 1 | B | BACK PANEL ASSY. | 1 | 4ML0832020 | 7 | | " " | 1 |
| 4ML0832004 | 1 | B | CHASSIS ASSY. | 1 | 4ML0832021 | 1 | C | FM CORRECTION CB | 1 |
| 4ML0832004 | 2 | E | " " | 1 | 4ML0832021 | 2 | E | " " " | 1 |
| 4ML0832005 | 1 | F | POWER SUPPLY ASSY. | 1 | 4ML0832021 | 3 | C | " " " | 1 |
| 4ML0832005 | 2 | C | " " " | 1 | 4ML0832021 | 4 | E | " " " | 1 |
| 4ML0832008 | 1 | F | RF. BOX FINAL ASSY. | 1 | 4ML0832022 | 1 | | POWER SUPPLY CB. | 1 |
| 4ML0832009 | 1 | C | RF BOX ASSY. | 1 | 4ML0832022 | 2 | C | " " | 1 |
| 4ML0832010 | 1 | D | RF BOX CENTRE PLATE | 1 | 4ML0832023 | 1 | | WIRE PREP. | 1 |
| 4ML0832010 | 2 | | " " " | 1 | 4ML0832024 | 1 | | BCD OPTION WIRE PREPARATION | 1 |
| 4ML0832011 | 1<br>2 | G<br>B | STRIP LINE OSC. & HARD START ASSY | 1 | 4ML0832025 | 1 | G | CASING | 1 |
| 4ML0832012 | 1 | D | ATTENUATOR ASSY. | 1 | | | | | |
| 4ML0832013 | 1 | E | VARACTOR OSC. CB. | 1 | 4ML0832013 | 4 | | VARACTOR OSC CB | 1 |
| 4ML0832013 | 2 | B | " " " | 1 | 4ML0832013 | 5 | G | " " | 1 |
| 4ML0832013 | 3 | E | " " " | 1 | 4ML0832013 | 6 | | " " | 1 |
| 4ML0832014 | 1 | C | AM. MOD_O/P AMP CB | 1 | | | | | |
| 4ML0832014 | 2 | F | " " | 1 | 4ML0832026 | 1 | A | RACK MOUNTING OPTION | 1 |
| 4ML0832014 | 3 | | " " | 1 | 4ML0832027 | 1 | C | REVERSE POWER PROTECTION | 1 |
| 4ML0832015 | 1 | | AGC / RANGE DEC. CB | 1 | | | | | |
| 4ML0832015 | 2 | D | " " " | 1 | | | | | |
| 4ML0832015 | 3 | | " " " | 1 | | | | | |
| 4ML0832016 | 1 | B | PRESCALER CB. | 1 | | | | | |
| 4ML0832016 | 2 | B | " " | 1 | | | | | |
| 4ML0832016 | 3 | C | " " | 1 | | | | | |
| 4ML0832017 | 1 | B | SYNTHESIZER CB | 1 | | | | | |
| 4ML0832017 | 2 | | " " | 1 | | | | | |
| 4ML0832017 | 3 | | " " | 1 | | | | | |
| 4ML0832018 | 1 | E | 2MHz REF OSC. CB. | 1 | 4ML0832018 | 3 | E | 2MHz REF OSC CB | 1 |
| 4ML0832018 | 2 | E | " " | 1 | | | | | |
| 4ML0832019 | 1 | | CONTROL CB. | 1 | | | | | |
| 4ML0832019 | 2 | | " " | 1 | | | | | |
| 4ML0832020 | 1 | | AUDIO CB. | 1 | | | | | |
| 4ML0832020 | 2 | | " " | 1 | | | | | |

| ISSUE | A | B | C | D. | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DATE | | 14.4.78 | 17/4/78 | 26.4.78 | 23.5.78 | 20.6.78 | 23 JUN 78 | 21 JULY 78 | 31 July 78 | 4 Aug 78 | 30 Aug 78 |
| MOD. No | ~ | Q4642 | Q4660 | 4676 | Q4693 | 4745 | 4792 | 4805 | 4877 | 4903 | 4926 |

| ISSUE | L | M | N | O | P | Q | R | S | T | U | V |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DATE | 29.9.78 | 3.10.78 | 6.Oct 78 | 10 Oct 78 | 16/10/78 | 8-11-78 | 8-11-78 | 16-11-78 | 1.12.78. | 7-12-78 | 11 DEC 78 |
| MOD. No | 4984 | Q4964 | 4965 | | 4962 | Q5077 | 5047 | Q5115 | Q4962 | Q5167 | 5142 |

AD 79 5451

AC 31-3-79 Q5420 5416

AB 21.3.79 Q5417

AA 5.3.79 5395

Z 14-2-79 Q5286

Y 3-2-79 Q5129

X 1-2-79 Q5250

W 10 Jan '79 5196 5041 5243

CIRCUIT BOARDS AND SILK SCREENS.

# UNIT KEY — FARNELL INSTRUMENTS LTD.

| INSTRUMENT | DRAWN | DATE | F. No. | SHT | UK |
|---|---|---|---|---|---|
| SSG520 | P.E. PEDLEY | 19.9.77 | 832 | 6 OF 7 | UK 832 |

| DRAWING No. | SHT. | ISS. | DESCRIPTION | QTY. |
|---|---|---|---|---|
| 2ZZ0832100 | 1 | C | VARACTOR OSC. CB. | 1 |
| 2ZZ0832100 | 2 | C | " " | 1 |
| 2ZZ0832101 | 1 | | " DRILLING | REF |
| 2ZZ0832102 | 1 | | " SCREEN | REF |
| 2ZZ0832103 | 1 | B | S.R. SCRN | REF |
| | 2 | D | | |
| 2ZZ0832104 | 1 | C | AM. MOD. CB. | 1 |
| 2ZZ0832104 | 2 | C | " " | 1 |
| 2ZZ0832105 | 1 | C | " " DRILLING | REF |
| 2ZZ0832106 | 1 | C | " " SCREEN | REF |
| 2ZZ0832107 | 1 | D | " " SR. SCRN | REF |
| 2ZZ0832108 | 1 | C | PRESCALER CB. | 1 |
| 2ZZ0832108 | 2 | D | " | 1 |
| 2ZZ0832109 | 1 | D | " DRILLING | REF |
| 2ZZ0832110 | 1 | | " SCREEN | REF |
| 2ZZ0832111 | 1 | C | " SR. SCRN | REF |
| | 2 | C | | |
| 2ZZ0832112 | 1 | B | SYNTHESIZER CB | 1 |
| 2ZZ0832112 | 2 | B | " | 1 |
| 2ZZ0832113 | 1 | C | " DRILLING | REF |
| 2ZZ0832114 | 1 | C | " SCREEN | REF |
| 2ZZ0832115 | 1 | B | " SR. SCRN. | REF |
| 2ZZ0832115 | 2 | B | " SR. SCRN | REF |
| 2ZZ0832116 | 1 | E | 2MHz REF OSC. CB | 1 |
| 2ZZ0832117 | 1 | E | " DRILLING | REF |
| 2ZZ0832118 | 1 | E | " SCREEN | REF |
| 2ZZ0832119 | 1 | E | " SR. SCRN | REF |
| 2ZZ0832120 | 1 | C | CONTROL CB. | 1 |
| 2ZZ0832120 | 2 | | " | 1 |
| 2ZZ0832121 | 1 | | " DRILLING | REF |
| 2ZZ0832122 | 1 | | " SCREEN | REF |
| 2ZZ0832123 | 1 | | " SR. SCRN. | REF |

| DRAWING No. | SHT. | ISS. | DESCRIPTION | QTY. |
|---|---|---|---|---|
| 2ZZ0832124 | 1 | C | AUDIO CB. | 1 |
| 2ZZ0832124 | | | " " | 1 |
| 2ZZ0832125 | 1 | | " DRILLING | REF |
| 2ZZ0832126 | 1 | C | " SCREEN | REF |
| 2ZZ0832127 | 1 | | " S.R SCRN | REF |
| 2ZZ0832128 | 1 | D | FM. CORRECTION CB. | 1 |
| 2ZZ0832128 | 2 | E | " " | 1 |
| 2ZZ0832129 | 1 | D | " " DRILLING | REF |
| 2ZZ0832130 | 1 | D | " " SCREEN | REF |
| 2ZZ0832131 | 1 | D | " " SR. SCRN | REF |
| | 2 | C | | |
| 2ZZ0832132 | 1 | C | POWER SUPPLY CB | 1 |
| 2ZZ0832133 | 1 | C | " DRILLING | REF |
| 2ZZ0832134 | 1 | B | " SCREEN | REF |
| 2ZZ0832135 | 1 | B | " SR. SCRN | REF |
| 2ZZ0832136 | 1 | | AGC. AMP & RANGE DECODER CB. | 1 |
| 2ZZ0832136 | 2 | | " " | 1 |
| 2ZZ0832137 | 1 | | " DRILLING | REF |
| 2ZZ0832138 | 1 | B | " SCREEN | REF |
| 2ZZ0832139 | 1 | | " SR. SCRN. | REF |
| 2ZZ0832140 | 1 | B | STRIPLINE OSCILLATOR 'HARD START CCT. BOARD | |
| 2ZZ832141 | 1 | B | " DRILLING | |
| 2ZZ832142 | 1 | B | " SCREEN | |
| 2ZZ832143 | 1 | A | " S.R. SCREEN | |
| 1ZY0832156 | 1 | | FRONT PANEL SCRN | REF |
| 2ZY0832157 | 1 | B | BACK PANEL SCRN | REF |
| 2ZY0832158 | 1 | | ATTN. DISC SCRN | REF |
| 2ZY0832159 | 1 | | TRANS. PLATE SCRN. | REF |
| 2ZY0832284 | 1 | A | METER SCRN | REF |

| ISSUE | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DATE | | 6.4.78 | 1&4 78 | 9.6.78 | 23 6 78 | 21 JULY 78 | 28 JULY 78 | 31 AUG 78 | 7 Sept 78 | 3.10.78 | 26.10.78 |
| MOD. No | ~ | 4621 4674 | 4642 4646 | 4693 | Q4745 | 4805 | 4877 4805 | 4926 (2) 4920 | 4931 (2) | Q4984 | Q4962 |
| ISSUE | L. | M | | | | | | | | | |
| DATE | 11 DEC '78 | 10 Jan '79 | | | | | | | | | |
| MOD. No | 5142 | 5041 | | | | | | | | | |

UNIT KEY — FARNELL INSTUMENTS LTD.

| INSTRUMENT | DRAWN | DATE | F No | SHT | |
|---|---|---|---|---|---|
| SSG520 | | | 832 | 7 OF 7 | UK 832 |

| DRAWING No | SHT | ISS. | DESCRIPTION | QTY |
|---|---|---|---|---|
| CIRCUIT DIAGRAMS. | | | | |
| 1ZX0832160 | 1 | F | VARACTOR OSC. | |
| 2ZX0832161 | 1 | I | A.M. MODULATOR | |
| 2ZX0832162 | 1 | G | PRESCALER & BUFF. AMP | |
| 1ZX0832163 | 1 | D | SYNTHESIZER | |
| 3ZX0832164 | 1 | G | 2Mhz REF. OSC. | |
| 2ZX0832165 | 1 | C | CONTROL BD. | |
| 2ZX0832166 | 1 | D | AUDIO BD. | |
| 2ZX0832166 | 2 | | " " | |
| 1ZX0832167 | 1 | E | F.M. CORRECTION | |
| 2ZX0832168 | 1 | C | POWER SUPPLY | |
| 2ZX0832169 | 1 | D | A.G.C. AMP/RANGE DEC. | |
| 3ZX0832170 | 1 | E | STRIP LINE OSC. | |
| 3ZX0832171 | 1 | A | 10dB STEP ATTENUATOR | |
| 1ZX0832172 | 1 | D | FRONT & REAR PANEL | |
| CONNECTION DIAGRAMS. | | | | |
| 3ZV0832270 | 1 | A | R.F BOX WIRING DIAG. LOWER SECTION | |
| 3ZV0832271 | 1 | A | CONTROL BD. WIRING | |
| 3ZV0832272 | 1 | E | SYNTH. BD. WIRING | |
| 3ZV0832273 | 1 | B | AUDIO B.D. WIRING | |
| 3ZV0832274 | 1 | C | R F BOX WIRING | |
| 3ZV0832275 | 1 | A | CRYSTAL REF BD. WIRING | |
| 3ZV0832276 | 1 | A | CALIBRATION POINTS | |
| 3ZV0832277 | 1 | A | F.M. CORR. BD. WIRING | |
| 3ZV0832278 | 1 | B | POWER SUPPLY ROUTING | |
| 3ZV0832279 | 1 | B | R.F. BOX (UPPER SECTION) | |
| 3ZV0832280 | 1 | A | POWER SUPPLY B.D. | |
| 3ZV0832281 | 1 | A | EARTH RETURNS | |
| 3ZV0832282 | 1 | C | OVERALL BLOCK DIAG. | |
| 3ZV0832283 | 1 | C | AUDIO BD. BLOCK DIAG. | |
| 3ZV0832284 | 1 | B | PROGRAMME SOCKET WIRING DIAGRAM | |
| 2ZV0832285 | 1 | B | DETAILED BLOCK DIAGRAM. | |

| DRAWING No. | SHT | ISS. | DESCRIPTION | QTY |
|---|---|---|---|---|
| 3ZQ0832301 | 1 | A | CHOKE L No. 8 | |
| 3ZQ0832302 | 1 | A | CHOKE L No. 17 | |
| 3ZQ0832303 | 1 | A | CHOKE L No. 7 | |
| 3ZQ0832304 | 1 | A | CHOKE L No. 16 | |
| 3ZQ0832305 | 1 | A | CHOKE L No. 6 | |
| 3ZQ0832306 | 1 | A | CHOKE L No. 14 | |
| 3ZQ0832307 | 1 | A | CHOKE L No. 4 | |
| 3ZQ0832308 | 1 | A | CHOKE L No. 12 | |
| 3ZQ0832309 | 1 | A | CHOKE L No. 2 | |
| 3ZQ0832310 | 1 | A | CHOKE L No 10 | |
| 3ZQ0832311 | 1 | A | CHOKE 1. | |
| 3ZQ0832312 | 1 | A | CHOKE 2. | |
| 3ZX0832285 | 1 | B | OPTION D | |
| 3SR0132 | 1 | D | [illegible] | 1 |

| ISSUE | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DATE | | 7.4.78 | 14.4.78 | 26.5.78 | 20.6.78 | 23 JUN 78 | 17-7-78 | 21.7.78 | 29-7-78 | 4 Aug 78 | 18 Aug 78 |
| MOD No. | ~ | 4574 | 4642 | 4693 | 4745 | 4792 | Q4693 | 4805 | Q4795 | 49[illegible]3 | 4919 |

| ISSUE | L | M | N | O | P | Q | R | S | T | U |
|---|---|---|---|---|---|---|---|---|---|---|
| DATE | 30-8-78 | 6 Oct 78 | 9-11-78 | | 9 Nov 78 | 1.12.78 | 7-12-78 | 15 JAN 79 | 5.3.79 | 31/3/79 |
| MOD. No. | 4926 | 4965 | Q5047 Q5067 Q5073 | | Q5092 | Q4962 | Q5156 | 5041 5243 | 5395 5351 | 5416 |

| QTY. | — | SHT. 1 OF 1 | DWG. 4 | ML0832001 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: FINAL | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSG 520. | No. OFF | F 832 | DRAWN PEP | CHECKED

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | | PART No. | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | F1 | FILLER EXTRUSION | | 2000832105 | | 2 | | |
| 2 | | BOF | END MOULDING SUPPORT | | 4SU000461 | | 8 | | |
| 3 | | F1 | MAINS PUSH PLATE | | 4BA0832 212 | | 1 | | |
| 4 | | BOF | MAINS PUSH ROD | | 3CB0832 213 | | 1 | | |
| 5 | | F1 | FRONT PANEL ASSY. | | 4ML0832002 | | 1 | | |
| 6 | | " | CHASSIS ASSY. | | 4ML0832004 | | 1 | | |
| 7 | | " | POWER SUPPLY ASSY. | | 4ML0832005 | | 1 | | |
| 8 | | " | SYNTHESIZER CB. ASSY. | | 4ML0832017 | | 1 | | |
| 9 | | " | CONTROL CB. ASSY. | | 4ML0832019 | | 1 | | |
| 10 | | " | AUDIO CB. ASSY. | | 4ML0832020 | | 1 | | |
| 11 | | " | FM. CORRECTION CB. ASSY. | | 4ML0832021 | | 1 | | |
| 12 | | BOF | TOP AND BOTTOM TRIM | | 3000832202 | | 2 | | |
| 13 | | | | | | | | | |
| 14 | | BOF | END MOULDING MODIFIED | | 30008322226 | | 2 | | |
| 15 | | BOF | END MOULDING | | 23V000024 | | 2 | | |
| | | | | | | | | | |
| 16 | | BOF | KNOB RED | SIFAM | K110 125 | | 1 | | |
| 17 | | " | KNOB CAP RED | " | C110 | | 1 | | |
| 18 | | " | CB. RETAINER | HARTWELL USA | HN5C-53-1 | | 4 | | |
| 19 | | " | SPRING | | 400/30987/XDK | | 1 | | |
| 20 | | " | C.B. RETAINER | HARTWELL USA | HN5P-53-1 | | 4 | | |
| 21 | | | | | | | | | |
| 22 | | B1 | M3 X 8MM PAN HEAD SCREW | | | | 6 | | |
| 23 | | " | M3 X 10MM " " " | | | | 6 | | |
| 24 | | " | M3 X 8MM CSK " " | | | | 20 | | |
| 25 | | " | M3 X 10MM HEX HEAD " | | | | 2 | | |
| 26 | | " | M3 FULL NUT | | | | 6 | | |
| 27 | | " | M3 FLAT WASHER | | | | 12 | | |
| 28 | | " | M3 SPRING WASHER | | | | 12 | | |
| 29 | | " | 6BA SERRATED WASHER | | | | 4 | | |
| 30 | | " | 6BA SOLDER TAG LONG | | | | 8 | | |
| 31 | | " | M3X16MM PAN HEAD SCREW | | | | 1 | | |
| 32 | | " | SLEEVES BLACK NOS 1 | | | | 9 | | |
| 33 | | | | | | | | | |
| 34 | | | | | | | | | |

| ISSUE | A | B | C |
|---|---|---|---|
| DATE | | 10-4-78 | 5/4/79 |
| MOD. No | ~ | +621 | Q5350 |

| QTY. | | SHT 1 OF 3 | DWG. 4 | ML 0832002 |
|---|---|---|---|---|
| USED ON | | ASSEMBLY TITLE FRONT PANEL | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

| FARNELL INSTRUMENTS LTD | No. OF | | DRAWN | CHECKED |
|---|---|---|---|---|
| SSG520 | | 832 | JC | [signature] |

| ITEM No | REF No | ORIGIN OF PART | DESCRIPTION | | PART No | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | F1 | FALSE FRONT PANEL | | 1BA0832191 | | 1 | | |
| 2 | | " | ATTENUATOR SWITCH MTG. PLATE | | 3BA0832209 | | 1 | | |
| 3 | | " | SWITCH MTG. PLATE | | 4BA0832252 | | 3 | | |
| 4 | | " | TWIN POT MTG. PLATE | | 4BA0832247 | | 1 | | |
| 5 | | " | PUSH ROD SUPPORT | | 4BA0832217 | | 1 | | |
| 6 | | " | L&RH BRACKETS | | 3CL0832203 | | 1 EACH | | |
| 7 | | " | BNC INSULATING WASHERS | | 4000832258 | | 3 | | |
| 8 | | BOF | FRONT PANEL | | 2AL0832190 | | 1 | | |
| 9 | | " | PERSPEX WINDOW (FITTED TO FRONT PANEL) | | 3000832211 | | 1 | | |
| 10 | | " | ATTENUATOR SWITCH DISC | | 2AE0832210 | | 2 | | |
| 11 | R17 | " | RESISTOR 5KGΩ | MULLARD | MR25 | | 1 | | |
| 12 | D5 | " | DIODE | TEXAS | 1N4148 | | 1 | | |
| 13 | S9 | BOF | THUMBWHEEL SWITCH | COSMOCORD-STDLER | 4ZP0832150 | | 1 | | |
| 14 | M1 | " | METER | SIFAM | 3Z00832151 | | 1 | | |
| 15 | M2 | " | EDGE METER (RED POINTER) | BERTRAM | 620/621G1D2 | | 1 | | |
| 16 | SW1 | " | SWITCH 3 POLE 3 WAY | C&K | 7303J2ZQ | | 1 | | |
| 17 | SW2,3 | " | " 2 " 2 " | " | 7203J2ZQ | | 2 | | |
| 18 | SW7 | " | " | A.B. ELECTRONICS | 4ZP0832155 | | 1 | | |
| 19 | LD1,2 | " | LED RED | FAIRCHILD | FLV140 | | 2 | | |
| 20 | LD3 | " | " YELLOW | " | FLV440 | | 1 | | |
| 21 | LD4,5 | " | " GREEN | " | FLV340 | | 2 | | |
| 22 | | " | " MOUNTINGS | " | FLS012 | | 5 | | |
| 23 | | " | NXO 'P' CLIP | | NXO | | 1 | | |
| 24 | | | BUSH | HEYCO | B-312-250 | | 1 | | |
| 25 | SKT1-3 | BOF | 'BNC' CONNECTOR | RADIALL | UG-1094B/U | | 3 | | |
| 26 | SKT4 | " | 'N' " | " | 161 323 | | 1 | | |
| 27 | | " | INSULATING BUSH | | ST100539 R280-902 | | 9 | | |
| 28 | | | | | | | | | |
| 29 | P1,P2 | BOF | POTENTIOMETER 5KΩ | COLVERN | CT1301/9S10% LIN | | 2 | | |
| 30 | | | | | | | | | |
| 31 | C1-4 | " | CAPACITOR 1μF 63V | WIMA | MD20A | | 4 | | |
| 32 | C6-7 | | " 1000PF | ERIE | 831 | | 2 | | |
| 33 | P3 | BOF | 10KΩ LINEAR POT WITH CHANGEOVER SWITCH (SW10) | AB | TYPE AR45 | | 1 | | |
| 34 | | | | | | | | | |
| 35 | | | | | | | | | |

| ISSUE | A | B | C | D |
|---|---|---|---|---|
| DATE | | 12-4-78 | 23-5-78 | 21-6-78 |
| MOD No | ~ | 4646 | 4693 | 4745 |

| QTY | | SHT 2 OF 3 | DWG. 4 | ML 0832002 |
|---|---|---|---|---|
| USED ON | | ASSEMBLY TITLE FRONT PANEL | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

| FARNELL INSTRUMENTS LTD. | No. OFF | F | DRAWN | CHECKED |
|---|---|---|---|---|
| SSG520 | | 832 | SC | [signature] |

| ITEM No. | REF No. | ORIGIN OF PART | DESCRIPTION | PART No. | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|
| 36 | | BOF | KNOB BLACK SIFAM | K211006 | | 2 | | |
| 37 | | " | " " WITH LINE " | W151006 | | 2 | | |
| 38 | | " | " " " " " | S151250 | | 3 | | |
| 39 | | " | " CAP BLACK " | C210 | | 2 | | |
| 40 | | " | " " " " | C150 | | 5 | | |
| 41 | | " | NUT COVER BLACK WITH LINE " | N151 | | 3 | | |
| 42 | | " | FIGURE DIAL PLAIN " (ENGRAVED TO DRG 400 0832248) | D210 | | 2 | | |
| 43 | | | | | | | | |
| 44 | | BOF | SPACER M3x25mm THR'D HEX | HARWIN | | 5 | | |
| 45 | | " | " M3x6mm " " | " | | 8 | | |
| 46 | | " | SEMI RIGID COAX SEALECTRO | UT141 | | .5m | | |
| 47 | PL1 | " | COAXIAL PLUG KINGS | 142-0281-001 | | 1 | | |
| 48 | | " | STANDOFF HARWIN | W6003/M2.5 | | 2 | | |
| 49 | | " | GRUB SCREW M3x4mm | | | 4 | | |
| 50 | | " | BUSH HEYCO | B-312-250 | | 1 | | |
| 51 | | | | | | | | |
| 52 | | BOF | RESISTOR S.O.T. | | | 1 | | |
| 53 | | | | | | | | |
| 54 | L1 | BOF | CHOKE 15μH | SC10 | | 1 | | |
| 55 | | | | | | | | |
| 56 | C8 | BOF | CAPACITOR 470PF. DISC TYPE | 861 | | | | |
| 57 | | | | | | | | |
| 58 | | | | | | | | |
| 59 | | | | | | | | |
| 60 | | | | | | | | |
| 61 | | | | | | | | |
| 62 | | | | | | | | |
| 63 | | | | | | | | |
| 64 | | | | | | | | |
| 65 | | | | | | | | |
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| 67 | | | | | | | | |
| 68 | | | | | | | | |
| 69 | | | | | | | | |
| 70 | | | | | | | | |

| ISSUE | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| DATE | 9-12-77 | 7-4-78 | 7-4-78 | 12-4-78 | 24-5-78 | 23-6-78 | 31 July 78 | 26-10-78 |
| MOD. No | 4456 | 4562P | 4574 | 4646 | 4693 | 4792 | 4877 | 4962 |

QTY 3 3 4 ML 0832002

ASSEMBL' TITLE: FRONT PANEL

KIT MARSHALLED ON

FARNELL INSTRUMENTS LTD. SSG520 | No. OF: | 832 | DRAWN 3C | CHECKED

| ITEM No. | REF No. | ORIGIN OF PART | DESCRIPTION | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUED |
|---|---|---|---|---|---|---|---|---|
| 71 | SW4 | BOF | SWITCH | AB. ELECTRONICS 4ZP0832152 | | 1 | | |
| 72 | SW5 | " | " | " 4ZP0832153 | | 1 | | |
| 73 | R4 | " | RESISTOR | 820KΩ 2% MULLARD CR25 | | 1 | | |
| 74 | R5 | " | " | 470KΩ " " " | | 1 | | |
| 75 | R6 | " | " | 2·2MΩ " " " | | 1 | | |
| 76 | R7 | " | " | 270KΩ " " MR25 | | 1 | | |
| 77 | R8 | " | " | 2·7MΩ " " CR25 | | 1 | | |
| 78 | R9 | " | " | 220KΩ " " MR25 | | 1 | | |
| 79 | R10 | " | " | 820KΩ " " CR25 | | 1 | | |
| 80 | R11 | " | " | 150KΩ " " MR25 | | 1 | | |
| 81 | R12 | " | " | 1MΩ " " CR25 | | 1 | | |
| 82 | R13 | " | " | 120KΩ " " MR25 | | 1 | | |
| 83 | R20 | " | " | 680KΩ " " CR25 | | 1 | | |
| 84 | R14 | " | " | 82KΩ " " MR25 | | 1 | | |
| 85 | R15 | " | " | 68KΩ " " " | | 1 | | |
| 86 | R16 | " | " | 56KΩ " " " | | 1 | | |
| 87 | R19 | " | " | 2K2Ω " " " | | 1 | | |
| 88 | D1-4 | " | DIODE | TEXAS IN4148 | | 8 | | |
| 89 | | " | STANDOFF | HARWIN W6003/M2·5 | | 3 | | |
| 90 | | B1 | SOLDER TAG 6BA | Ross Courtney RC383 | | 1 | | |
| 91 | | BOF | STANDOFF | HARWIN W6005/M2·5 | | 1 | | |
| 92 | | | WHEN KITTING PLEASE PUT ITEMS 71-90 IN SAME PACKAGE | | | | | |
| 93 | | | | | | | | |
| 94 | SW6 | BOF | SWITCH | AB ELECTRONICS 4ZP0832154 | | 1 | | |
| 95 | R1 | " | RESISTOR | 10KΩ MULLARD MR25 | | 1 | | |
| 96 | R2 | " | " | 39KΩ " " | | 1 | | |
| 97 | R3 | " | " | 150KΩ " " | | 1 | | |
| 98 | C5 | " | CAPACITOR | 10μF 25V TANTALUM E6K10 E25 | | 1 | | |
| 99 | | " | STANDOFF | HARWIN W6003/M2·5 | | 2 | | |
| 100 | | | | | | | | |
| 101 | | | WHEN KITTING PLEASE PUT ITEMS 94-99 IN SAME PACKAGE | | | | | |
| 102 | | | | | | | | |
| 103 | | | | | | | | |
| 104 | | | | | | | | |
| 105 | | | | | | | | |

| ISSUE | A | B | C | D | E |
|---|---|---|---|---|---|
| DATE | | 23-5-78 | 4/8/78 | 20-10-78 | 8-11-78 |
| MOD No | | 4693 | Q4877 | Q5023 | S047 |

| QTY. | – | SHT. 1 OF 1 | DWG. 4 | ML 0832003 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: BACK PANEL. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

| FARNELL INSTRUMENTS LTD. SSG 520 | No. OFF | F 832 | DRAWN PEP | CHECKED |
|---|---|---|---|---|

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUED |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | FI. | BACK PANEL SCREENED | | 3AE0832 235 | | 1 | | |
| 2 | | " | COVER PLATE | | 4AE0832 243 | | 1 | | |
| 3 | | " | CRYSTAL REF. CB. ASSEMBLY | | 4ML0832018 | | 1 | | |
| 4 | | " | INSULATING PLATE | | 4000832 240 | | 1 | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | SKT5-8 | BOF | BNC. SOCKET | RADIALL | UG-1094B/U | | 4 | | |
| 8 | | " | INSULATING BUSH | | ST100 539. | | 4 | | |
| 9 | SW8 | " | SWITCH | C & K | 7201 KZQ | | 1 | | |
| 10 | | " | SPACER M3x 25mm THR'D HEX | HARWIN | | | 4 | | |
| 11 | | | | | | | | | |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |
| 14 | | BI | SCREW M3x 8mm PAN HD. POZI DRIV | | | | 10 | | |
| 15 | | " | WASHER FLAT M3 | | | | 8 | | |
| 16 | | " | " SPRING M3 | | | | 10 | | |
| 17 | | " | FULL NUT M3 | | | | 4 | | |
| 18 | | " | SOLDER TAG GBA | ROSS COURTNEY | RC383 | | 1 | | |
| 19 | | " | RUBBER SLEEVE BLACK | HELLERMAN | N15 x 10 | | 4 | | |
| 20 | | " | T.C. WIRE 22SWG | | | | 120mm | | |
| 21 | | | | | | | | | |
| 22 | | | | | | | | | |
| 23 | | | | | | | | | |
| 24 | | | | | | | | | |
| 25 | | | | | | | | | |
| | | BOF | 1/2 HINGE MODIFIED TO DRG 4000832241. | | REQUIRED | | 1 | | |
| | | | ON THIS ASSEMBLY REF POWER SUPPLY ML 0832005 | | | | | | |
| 26 | | | | | | | | | |
| 27 | | | | | | | | | |
| 28 | | | | | | | | | |
| 29 | | | | | | | | | |
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| ISSUE | A | B |
|---|---|---|
| DATE | | 24 5.78 |
| MOD. No | ~ | 4693 |

| QTY. | — | SHT 1 OF 2 | DWG. 4 | ML0832004 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: CHASSIS | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSC 520 | No. OFF | = 832 | DRAWN PEP | CHECKED

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | PART No. | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|
| 1 | | FI | RH. SIDE PANEL | 2CL0832192 | | 1 | | |
| 2 | | " | LH. " | 2CL0832193 | | 1 | | |
| 3 | | " | BOTTOM REAR BAR | 3AE0832194 | | 1 | | |
| 4 | | " | CB. CENTRE PLATE | 2BA0832196 | | 1 | | |
| 5 | | " | CB. MOUNTING BRACKET | 3BA0832198 | | 2 | | |
| 6 | | " | CENTRE BAR | 3BA0832199 | | 2 | | |
| 7 | | " | CB. MOUNTING BRACKET | 3BA0832200 | | 1 | | |
| 8 | | " | GUIDE SUPPORT BRACKET | 3BA0832201 | | 1 | | |
| 9 | | " | TOP AND BOTTOM TRIM | 3000832202 | | 2 | | |
| 10 | | " | CENTRE PLATE | 2BA0832216 | | 1 | | |
| 11 | | " | HINGE BRACKET | 4BA0832218 | | 2 | | |
| 12 | | BOF | CONNECTOR SUPPORT BAR 'A' | 3BA0832219 | | 3 | | |
| 13 | | BOF | " " " 'B' | 3BA0832220 | | 1 | | |
| 14 | | BOF | HANDLE LOCATION COVER | 4AC0832223 | | 4 | | |
| 15 | | FI | SPACER | 4BA0832224 | | 4 | | |
| 16 | | " | SIDE TRIM | 2000832225 | | 2 | | |
| 17 | | " | P/S. SECURING BRACKET | 4CL0832229 | | 1 | | |
| 18 | | BOF | HANDLE LESS METAL INSERTS (MOD. TO 4AE0832230) | 3SU0000457 | | 2 | | |
| 19 | | FI | TOP REAR BAR | 3AE0832246 | | 1 | | |
| 20 | | " | COVER LOCATION SPACER | 4CL0832250 | | 4 | | |
| 21 | | " | FALSE HANDLE | 4AE0832261 | | 4 | | |
| 22 | | FI | BACK PANEL ASSY. | 4ML0832003 | | 1 | | |
| 23 | | " | RF BOX ASSY. | 4ML0832008 | | 1 | | |
| 24 | | " | FRONT PANEL LOOM | LB361 | | 1 | | |
| 25 | | " | POWER SUPPLY LOOM | LB362 | | 1 | | |
| 26 | | " | LH FIXING | 3CL0832214 | | 1 | | |
| 27 | | BOF | INTER CONTACT KEYING PLUG AMP | 582501-1 | | 3 | | |
| 28 | | BOF | CAMLOCK RECEPTACLE | 312-12 | | 1 | | |
| 29 | | BOF | CB. EDGE CONNECTOR 30 WAY | 480146_7 | | 2 | | |
| 30 | | " | " " 18 WAY AMP | 280207 | | 1 | | |
| 31 | | " | 'P' CLIP INSULOID | NX3 | | 2 | | |
| 32 | | " | " " | NX4 | | 3 | | |
| 33 | | " | HANDLE (COMPLETE) | 3SU0000457 | | 2 | | |
| 34 | | | | | | | | |
| 35 | | " | CAMLOCK RECEPTACLE | 26R6-1BB | | 2 | | |

| ISSUE | A | P2 | B | C | D |
|---|---|---|---|---|---|
| DATE | | 21-3-78 | 17/4/78 | 20 6 78 | 18-11-78 |
| MOD. No | | Q4625 | Q4660 | Q4745 | Q5099 |

QTY. | SHT 1 OF 2 | DWG 4 | ML 0832005

USED ON UK832

ASSEMBLY TITLE: POWER SUPPLY

TO BE KIT BY MARSHALLED | KIT MARSHALLED ON

FARNELL INSTRUMENTS LTD. SSC 520 | No OFF | F 0832 | DRAWN REP | CHECKED

| ITEM No | REF. No | ORIGIN OF PART | DESCRIPTION | | PART No | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | FI | HEATSINK BRACKET | | 4AE0832179 | | 1 | | |
| 2 | | " | N°1 BRACKET | | 3AE0832182 | | 1 | | |
| 3 | | " | N°2 " | | 4AE0832183 | | 1 | | |
| 4 | | " | N°3 " | | 4AE0832184 | | 1 | | |
| 5 | | " | N°4 " | | 3AE0832185 | | 1 | | |
| 6 | | " | N°5 " | | 3AE0832186 | | 1 | | |
| 7 | | " | N°6 " | | 3AE0832187 | | 1 | | |
| 8 | | " | HEATSINK | | 3CH0832188 | | 1 | | |
| 9 | | " | POWER SUPPLY CB. ASSY. | | 4ML0832022 | | 1 | | |
| 10 | | " | " " LOOM | | LB3666 | | 1 | | |
| 11 | | " | BACK SUPPORT | | 4AE0832313 | | 1 | | |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |
| 14 | | BOF | TRANSFORMER ALT. ST 3VES WINDINGS | AVEL LINDBERG | 3SR0132 | | 1 | | |
| 15 | | " | MAINS SWITCH DPDT (2 LOCKNUTS) | | MSPB206N FUGISUCU OR WYCOMKPG206N | | 1 | | |
| 16 | | " | MAINS FILTER PLUG | CORCOM | VS&F 6J4 | | 1 | | |
| 17 | IC1 * | " | INTEGRATED CIRCUIT | | uA78GUIC | | 1 | | |
| 18 | IC2 * | " | " " | MOTOROLA | MC7715CP | | 1 | | |
| 19 | IC3 * | " | " " | " | MC7824 | | 1 | | |
| 20 | | " | FASTENER STUD | CAMLOCK | 2851_4 | | 1 | | |
| 21 | | | | | | | | | |
| 22 | | " | " WASHER | " | 28510_2 | | 1 | | |
| 23 | | " | MICA WASHER | RCA | DF103C | | 3 | | |
| 24 | | " | GROMMET 1/2" dia | MEADOWS | M61H | | 1 | | |
| 25 | | " | SPACER M3x 6mm THR'D HEX | HARWIN | | | 2 | | |
| 26 | | " | HINGE | HARTWELL | H1002D1_3W1 | | 1 | | |
| | | | 1/2 HINGE USED ON THIS ASSY. OTHER 1/2 MODIFIED TO DRG. 4000832241 AND FITTED ON BP. ASSY. | | | | | | |
| 27 | | BOF | INSULATION BUSH | | 4SV00017 | | 2 | | |
| 28 | | " | " " | | 56201A | | 1 | | |
| 29 | | " | RUBBER BUFFER | MEADOWS | WS | | 1 | | |
| 30 | | * | IC MUST NOT BE REMOVED FROM HOLDER EXCEPT WITH INSERTION TOOL | | | | | | |
| 31 | | BI | SCREW M4 x 30mm PAN HD POZI DRV | | | | 1 | | |
| 32 | | BI | SCREW M4 x 12 mm PAN HD POZI DRIV | | | | 1 | | |
| 33 | | " | " M3 x 16 mm " " | | | | | | |

| ISSUE | | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| DATE | 17.12.77 | 23.5.78 | 20.6.78 | 29.9.78 | 8-11-78 | 8-11-78 | 29-1-79 |
| MOD No | 11?6 | Q4693 | Q4745 | Q4984 | Q5067 | 5047 | Q5304 |

| QTY. | — | SHT 2 OF 2 | ISS 4 | ML 0832005 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: POWER SUPPLY | | |
| | | TO BE RE-MARSHALLED | RE-MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSG 520 | No. OFF | F 832 | DRAWN PEP | CHECKED

| ITEM No | REF. No. | ORIGIN OF PART | DESCRIPTION | PART No | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUED |
|---|---|---|---|---|---|---|---|---|
| 34 | | BI. | SCREW M3 x 12mm PAN HD. POZI DRIV | | | 3 | | |
| 35 | | " | " M3 x 10 mm " " | | | 2 | | |
| 36 | | " | " M3 x 8 mm " " | | | 15 | | |
| 37 | | " | " M2.5 x 12mm " " | | | 2 | | |
| 38 | | " | WASHER SPRING M4 | | | 2 | | |
| 39 | | " | " " M3 | | | 29 | | |
| 40 | | " | " " M2.5 | | | 2 | | |
| 41 | | " | " FLAT M3 | | | 26 | | |
| 42 | | " | " " M2.5 | | | 2 | | |
| 43 | | " | FULL NUT M3 | | | 9 | | |
| 44 | | " | " " M2.5 | | | 2 | | |
| 45 | | " | SOLDER TAG 6BA | ROSS COURTNEY | RC383 | 3 | | |
| 46 | | " | RUBBER SLEEVE | HELLERMAN | N20 x 20mm BLK | 13 | | |
| 47 | | " | SCREW M3 x 20 mm PAN HD. POZI DRIV | | | 2 | | |
| 48 | | " | WASHER FLAT M4 | | | 1 | | |
| 49 | | " | SPACER M4 x 20 mm HEX | HARWIN | R4037 | 1 | | |
| 50 | | | | | | | | |
| 51 | | | | | | | | |
| 52 | | BOF | TRANSFORMER CLAMP | V. TESSIER | T8714 | 1 | | |
| 53 | | " | RESILIENT PAD | V. TESSIER | T8715 | 1 | | |
| 54 | | | | | | | | |
| 55 | | | | | | | | |
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| 68 | | | | | | | | |

| ISSUE | A | B | C |
|---|---|---|---|
| DATE | | 8-11-78 | 8-11-78 |
| MOD No | ~ | Q5067 | 5047 |

QTY. 1 | USED ON UK 832

SHT. 2 OF 2 | DWG. 4 | ML 0832 004

ASSEMBLY TITLE: CHASSIS

TO BE KIT BY MARSHALLED | KIT MARSHALLED ON

FARNELL INSTRUMENTS LTD. | No. OFF | F 832 | DRAWN J.C. | CHECKED

SSG 520

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUED |
|---|---|---|---|---|---|---|---|---|
| 36 | | BOF | INSULATING BUSH | 56201-A | | 6 | | |
| 37 | | BI | M3 X 12 PAN HD. POZI DRIVE | | | 6 | | |
| 38 | | BI | M3 X 10 " " " | | | 2 | | |
| 39 | | BI | M3 SPRING WASHER | | | 4 | | |
| 40 | | BI | M3 FLAT " | | | 4 | | |
| 41 | | BI | M3 WAVY " | | | 7 | | |
| 42 | | BOF | RETAINING SPRING AMP | 42973-1 | | 5 | | |
| 43 | | BOF | BUSH. HEYCO | B312-250 | | 1 | | |
| 44 | | | L & R H. BRACKETS | 3CB0832203 | | 2 | | |
| | | | 'P' CLIP | NX4 | | 1 | | |
| | | BOF | M3 X 8MM HEX HEAD SCREW | | | 3 | | |
| 46 | | BOF | WHITE INSULATING BUSH 6SPK | TO3SMALL | | 8 | | |

| | A | B | C | D | E |
|---|---|---|---|---|---|
| DATE | 20.6.78 | 31 July '78 | 3/10/78 | 20-10-78 | 1-2-79 |
| | Q4745 | 4877 | Q4962 | Q5023 | Q5250 |

| QTY. | - | SHT. 1 OF 1 | DWG. 4 | ML 0832008 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: RF. Box FINAL. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

| FARNELL INSTRUMENTS LTD. SSC 520 | No. OFF | F 832 | DRAWN REP | CHECKED |
|---|---|---|---|---|

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | PART No. | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|
| 1 | | BOF | GUIDE RAIL | 3CB0832227 | | 2 | | |
| 2 | | F1 | RF. Box (MECH) ASSY. (PRE TESTED) | 4ML0832009 | | 1 | | |
| 3 | | " | RF. Box CENTRE PLATE ASSY. | 4ML0832010 | | 1 | | |
| 4 | | " | RH FIXING BRACKET | 3CL0832215 | | 1 | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | BOF | RF GASKET 3 x 9mm | KNITMESH 8035 | | 1.3m. | | |
| 9 | | " | EARTH TAG | 4SUCF0486 | | 1 | | |
| 10 | | " | M3 x 10mm Long HEX. HD. SCREW | | | 2 | | |
| 11 | | " | M3 FULL NUT | | | 2 | | |
| 12 | | " | M3 WASHER PLAIN | | | 2 | | |
| 13 | | " | M3 SPRING WASHER | | | 2 | | |
| 14 | | " | M3 x 8mm PAN. HD. | | | 4 | | |
| 15 | | " | M3 FULL NUT | | | 4 | | |
| 16 | | " | M3 WASHER PLAIN | | | 4 | | |
| 17 | | " | M3 WASHER SPRING | | | 4 | | |
| 18 | | " | M4 WASHER PLAIN | | | 4 | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
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| 35 | | | | | | | | |

| ISSUE | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| DATE | | 20/6/78 | 16-11-78 | 24-1-79 | 19-2-79 | 5-4-79 | 5/4/79 |
| MOD. No | | [illegible] 4 | Q5115 | Q5286 | Q5371 | Q5451 | Q5350 |

QTY. 1 | SHT 1 OF 1 | DWG # ML0832009

USED ON UK832 | ASSEMBLY TITLE: RF Box

TO BE KIT BY | KIT MARSHALLED BY | MARSHALLED IN

FARNELL INSTRUMENTS LTD. | No. OFF | F832 | DRAWN PEP | CHECKED

SSC 520

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUED |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | BOF | RF. BOX LID | 1CN0832180 | | 1 | | |
| 6 | | " | RF. BOX | 1CJ0832181 | | 1 | | |
| 7 | | " | FEEDTHROUGH 1750pf ERIE | 1214-001 | | 56 | | |
| 8 | | " | FERRITE BEAD MULLARD | FX1115 | | 25 | | |
| 9 | | " | BULK HEAD FEEDTHROUGH ALT. SEALATRO KINGS | 5067500031 879-13 | | 1 | | |
| 10 | | " | CAMLOCK RECEPTACLE CAMLOCK | 26R6-1BB | | 2 | | |
| 11 | | " | " STUD " | 2600-11 | | 4 | | |
| 12 | | " | " WASHER " | 2755-1 | | 4 | | |
| 13 | | " | CHOKE 15uH | SC10 | | 1 | | |
| 14 | | " | BUSH HEYCO | B-312-250-062 | | 2 | | |
| 15 | | " | DISCOIDAL FEEDTHRD 1000pf. ERIE | CDFT 100 | | 5 | | |
| 16 | | BOF | CHOKE 1 WOUND ON FX1115 | 32Q0832311 | | 2 | | |
| 17 | | BI | SCREW M3 x 12mm PAN HD. POZI DRIV | | | 2 | | |
| 18 | | " | " M2.5 x 6mm C'SK HD. POZI DRIV | | | 8 | | |
| 19 | | " | WASHER FLAT M3 | | | 8 | | |
| 20 | | " | " SPRING M3 | | | 8 | | |
| 21 | | " | " " M2.5 | | | 8 | | |
| 22 | | " | FULL NUT M3 | | | 6 | | |
| 23 | | " | " " M2.5 | | | 8 | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | BOF | SOLDER | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |
| 30 | | | | | | | | |
| 31 | | | | | | | | |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |

| ISSUE | A | B | C | D | E |
|---|---|---|---|---|---|
| DATE | | 21-7-78 | 31 July '78 | 13-9-78 | 3/10/78 |
| MOD. No | ~ | Q4603 | 4877 | Q4931 | Q4962 |

| QTY. | — | SHT 1 OF 1 | DWG 4 | ML 0832010 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: RF. BOX CENTRE PLATE | | |
| | | TO BE KIT BY / MARSHALLED | KIT MARSHALLED ON | |

| FARNELL INSTRUMENTS LTD. SSC 520 | No. OFF | UK832 | DRAWN PEP | CHECKED |
|---|---|---|---|---|

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | | | PART No. | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | F1 | CENTRE PLATE | | | 2BA0832 232 | | 1 | | |
| 2 | | " | PRESCALER BOX LID | | | 3CJ0832228 | | 1 | | |
| 3 | | " | PRESCALER BOX | | | 3CJ0832 236 | | 1 | | |
| 4 | | " | STRIP LINE OSCILLATOR ASSY. | | | 4ML0832011 | | 1 | | |
| 5 | | " | ATTENUATOR ASSY. | | | 4ML0832012 | | 1 | | |
| 6 | | " | VARACTOR OSCILLATOR CB. ASSY. | | | 4ML0832013 | | 1 | | |
| 7 | | " | AMP. MODULATOR & O/P AMP CB. ASSY. | | | 4ML0832014 | | 1 | | |
| 8 | | " | AGC. AMP & RANGE DECODER CB. ASSY | | | 4ML0832015 | | 1 | | |
| 9 | | " | PRESCALER AND BUFFER AMP. CB. ASSY | | | 4ML0832016 | | 1 | | |
| 10 | | " | LOOM | | | LB363 | | 1 | | |
| 11 | | " | LOOM | | | LB364 | | 1 | | |
| 12 | | " | LOOM | | | LB365 | | 1 | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | | BOF | CAPACITOR | 1000μf | 35V | WIMA | FRINTYLIT | 1 | | |
| 17 | | " | " | 0·68μf | 250V | MULLARD | C280AE/A680K | 1 | | |
| 18 | | " | RESISTOR | 5K6Ω | 2% | " | MR25 | 1 | | |
| 19 | | " | " | SOT | " | " | " | 1 | | |
| 20 | | " | " | SOT | " | " | CR25 | 1 | | |
| 21 | | " | STANDOFF | | | HARWIN | W6005/M2·5 | 5 | | |
| 22 | | " | SPACER | M3x 6mm | THR'D HEX | " | | 15 | | |
| 23 | | " | " | M3x 18mm | " " | " | | 4 | | |
| 24 | | " | GROMMET | 5/16" | | MEADOWS | M14H | 1 | | |
| 25 | | " | " | 3/16" | | HELLERMAN | HV2326 | 2 | | |
| 26 | | " | THERMAL COMPOUND | | | REDPOINT | THERMPATH | AS REQD | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |
| 30 | | B1. | SOLDER TAG | 6BA | | ROSS COURTNEY | RC383 | 7 | | |
| 31 | | | | | | | | | | |
| 32 | | | | | | | | | | |
| 33 | | | | | | | | | | |
| 34 | | | | | | | | | | |
| 35 | | | | | | | | | | |

| ISSUE | A | B | C | D |
|---|---|---|---|---|
| DATE | | 23.5.78 | 15-7-78 | 31 July '78 |
| MOD. No | | 94-93 | Q4603 | 4877 |

| QTY. | – | SHT. 1 OF 2 | DWG. 4 | ML 0832011 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: STRIP LINE OSCILLATOR | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSC 520 | No. OFF | F 832 | DRAWN PEP | CHECKED

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | ISSU |
|---|---|---|---|---|---|---|---|---|
| 1 | | FI | PART A. | 2CJ0832204 | | 1 | | |
| 2 | | " | " B. | 3000832205 | | 1 | | |
| 3 | | " | " C. | 4000832206 | | 1 | | |
| 4 | | " | " D. | 4000832207 | | 1 | | |
| 5 | | " | " E. | 4BB0832208 | | 1 | | |
| 6 | | " | INSULATOR ROD | 4000832245 | | 2 | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | VT1 | BOF | TRANSISTOR SILICONIX | U315 | | 1 | | |
| 10 | D1_4 | " | VARACTOR DIODE THOMPSON CSF ONLY | BB105BM | | 4 | | |
| 11 | | | | | | | | |
| 12 | R2.R5 | " | " 5·6kΩ 2% MULLARD | MR25 | | 2 | | |
| 13 | R3 | " | " 33kΩ " " | " | | 1 | | |
| 14 | R4 | " | " 1kΩ " " | " | | 1 | | |
| 15 | R6 | " | " SOT. | | | | | |
| 16 | R7 | " | " 10kΩ 2% MULLARD | MR25 | | 1 | | |
| 17 | | | | | | | | |
| 18 | C1 | BOF | CAPACITOR 47PF ERIE | N750/YD | | 1 | | |
| 19 | C2 | " | " 1.5PF " | 861/NPO | | 1 | | |
| 20 | C3 | " | " S.O.T | | | | | |
| 21 | | BOF | DISCOIDAL FEEDTHRO' 1000 PF. ERIE | CDFT 100 | | 5 | | |
| 22 | | " | LEADTHRO' HARWIN | W7001 | | 1 | | |
| 23 | | " | M3 TAG. | 4.5543 | | 4 | | |
| 24 | | | | | | | | |
| 25 | | BI | SOLDER TAG GOBA ROSS_COURTNEY | RC383 | | 3 | | |
| 26 | | " | E.C. WIRE | | | 80mm | | |
| 27 | | " | SCREW M3×8mm PAN HD POZI DRIV | | | 4 | | |
| 28 | | " | " M2.5×6mm " " | | | 1 | | |
| 29 | | " | WASHER SPRING M3 | | | 4 | | |
| 30 | | " | " " M2.5 | | | 1 | | |
| 31 | | " | FULL NUT M3 | | | 4 | | |
| 32 | | " | " " M2.5 | | | 1 | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |

| ISSUE | | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| DATE | [illegible] | 6.4.78 | 7-4-78 | 31 July 78 | 3.10.78. | 17.11.78. | 5.3.79 |
| MOD. No | [illegible] | 4570 | 4574 | 4877 | Q4964 | Q5047 | 5396 |

QTY.

USED ON UK832

SHT. 2 OF 2 | DWG. 4 | ML 0832011

ASSEMBLY TITLE STRIP LINE OSCILLATOR HARD START CIRCUIT BOARD

TO BE KIT BY MARSHALLED | KIT MARSHALLED ON

FARNELL INSTRUMENTS LTD. SSG 520 | No. OFF | F832 | DRAWN A.M. | CHECKED

| ITEM No | REF. No. | ORIGIN OF PART | DESCRIPTION | | | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUED |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | BoF | CIRCUIT BOARD | MASTER | | 2ZZ832140 | | | | |
| | | | | SCREEN | | 2ZZ832142 | | | | |
| | | | | DRILLING | | 2ZZ832141 | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | R1 | | RESISTOR | S.O.T. | | | | | | |
| 5 | R8 | | " | 3.9M | MULLARD | CR25 | | 1 | | |
| 6 | R9 | BoF | " | 10K | MULLARD | MR25 | | 1 | | |
| 7 | R10 | " | " | 4K7 | MULLARD | " | | 1 | | |
| 8 | R11 | " | " | 56Ω | " | " | | 1 | | |
| 9 | | | | | | | | | | |
| 10 | C4 | BoF | CAPACITOR | 15μF 40V | MULLARD | 015 17159 | | 1 | | |
| 11 | D5 | " | DIODE | | | IN4148 | | 1 | | |
| 12 | | | | | | | | | | |
| 13 | VT2 | | DARLINGTON TRANSISTOR | | MOTOROLA | MPS – A13 | | 1 | | |
| 14 | VT3 | | TRANSISTOR | | | BC182(TO18) | | 1 | | |
| 15 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 17 | | BOF | EYELETS | | TUCKER FASTENERS LTD | G853 | | 2 | | |
| 18 | | | | | | | | | | |
| 19 | | | FIBRE WASHER | | | 6BA | | 4 | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 23 | | | PLEASE KIT MARSHALL SHEETS 1&2 | | | | | | | |
| 24 | | | IN SEPARATE TRAYS | | | | | | | |
| 25 | | | | | | | | | | |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| 31 | | | | | | | | | | |
| 32 | | | | | | | | | | |
| 33 | | | | | | | | | | |

| ISSUE | A | B |
|---|---|---|
| DATE | 3.10.78 | 11 DEC 78 |
| MOD. No | 4964 | 5142 |

| QTY. | – | SHT. 1 OF 1 | DWG. 4 | ML 0832012 |
|---|---|---|---|---|
| USED ON | UK 832 | ASSEMBLY TITLE: ATTENUATOR | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

| FARNELL INSTRUMENTS LTD. SSC 520. | No. OFF | F 832 | DRAWN PEP | CHECKED |
|---|---|---|---|---|

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | ISSU |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | B.O.F. | ATTENUATOR MECHANICAL ASSEMBLY | | 2000832261 | | 1 | | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | BOF | RELAY | TELEDYNE | 712-26 | | 6 | | |
| 10 | | " | FEEDTHROUGHS | ERIE | 1214-001 | | 8 | | |
| 11 | | " | RESISTORS 96.3Ω | RESOLUTE | FC55 | | 2 | | |
| 12 | | " | " 61.1Ω | " | " | | 2 | | |
| 13 | | " | " 71.2Ω | " | " | | 1 | | |
| 14 | | " | " 247Ω | " | " | | 1 | | |
| 16 | | " | " 2k4Ω | MULLARD | MR25 | | 2 | | |
| 16 | | " | " 100Ω | " | MR25 | | 8 | | |
| 17 | | " | CAPACITOR 1.5pF | ERIE | NPO 861 | | 6 | | |
| 18 | | " | " 3.3pF | " | NPO 861 | | 2 | | |
| 19 | | " | | | | | | | |
| 20 | | " | HEATSINK | JERMYN | 2211 | | 6 | | |
| 21 | | " | DIODE | TEXAS | IN4148 | | 5 | | |
| 22 | | " | FERRITE BEAD | MULLARD | FX1115 | | 4 | | |
| 23 | | " | SEMI RIGID COAXITUBE | | UT85 | | 0.75M. | | |
| 24 | | " | " " | | UT141 | | 0.3M. | | |
| 25 | | " | COAXIAL PLUG | KINGS | 142-0281-001 | | 1 | | |
| 26 | | | | | | | | | |
| 27 | | BI. | C.B. PIN | TUCKER | MR15100 | | 14 | | |
| 28 | | | | | | | | | |
| 29 | | | | | | | | | |
| 30. | | | | | | | | | |
| | | | SOLDER REQUIRMENTS TO BE DETERMINED | | | | | | |

| ISSUE | A | B | C | D | E |
|---|---|---|---|---|---|
| DATE | | 7-4-78 | 12-4-78 | 17/4/78 | 4/8/78 |
| MOD. No | ~ | 4574 | 4646 | Q4660 | Q4877 |

| QTY | — | SHT 1 OF 6 | DWG 4 | ML 0832013. |
|---|---|---|---|---|

USED ON: UK832

ASSEMBLY TITLE: VARACTOR OSCILLATOR CB.

TO BE KIT BY MARSHALLED | KIT MARSHALLED ON

FARNELL INSTRUMENTS LTD — SSG 520. | NO. OFF | 832 | DRAWN: PEP | CHECKED

| ITEM No | REF No | ORIGIN OF PART | DESCRIPTION | PART No | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|
| 1 | | | BOF CIRCUIT BOARD MASTER | 2ZZ0832100½ | | 1 | | |
| | | | " " DRILLING | 2ZZ0832101 | | REF | | |
| | | | " " SCREEN | 2ZZ0832102 | | REF | | |
| | | | " " SOLDER RESIST SCREEN | 2ZZ0832103 | | REF | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | R1 | | BOF RESISTOR 1kΩ 2% MULLARD | MR25 | | 1 | | |
| 5 | R2 | | " " 47kΩ " " | " | | 1 | | |
| 6 | R3 | | " " 4k7Ω " " | " | | 1 | | |
| 7 | R4 | | " " 47Ω " " | " | | 1 | | |
| 8 | R5 | | " " 10kΩ " " | " | | 1 | | |
| 9 | R6 | | " " OMIT " " | " | | | | |
| 10 | R7 | | " " 1kΩ " " | " | | 1 | | |
| 11 | R8 | | " " 47kΩ " " | " | | 1 | | |
| 12 | R9 | | " " 4k7Ω " " | " | | 1 | | |
| 13 | R10 | | " " 47Ω " " | " | | 1 | | |
| 14 | R11 | | " " 10kΩ " " | " | | 1 | | |
| 15 | R12 | | " " OMIT " " | " | | | | |
| 14 | R13 | | " " 1kΩ " " | " | | 1 | | |
| 16 | R14 | | " " 47kΩ " " | " | | 1 | | |
| 17 | R15 | | " " 4k7Ω " " | " | | 1 | | |
| 18 | R16 | | " " 47Ω " " | " | | 1 | | |
| 19 | R17 | | " " 10kΩ " " | " | | 1 | | |
| 20 | R18 | | " " OMIT " " | " | | | | |
| 21 | R19 | | " " 18kΩ " " | " | | 1 | | |
| 22 | R20 | | " " 47kΩ " " | " | | 1 | | |
| 23 | R21 | | " " 10kΩ " " | " | | 1 | | |
| 24 | R22 | | " " 47Ω " " | " | | 1 | | |
| 25 | R23 | | " " 10kΩ " " | " | | 1 | | |
| 26 | R24 | | " " OMIT " " | " | | | | |
| 27 | R25 | | " " 10kΩ " " | " | | 1 | | |
| 28 | R26 | | " " 2k2Ω " " | " | | 1 | | |
| 29 | R27 | | " " 27kΩ " " | " | | 1 | | |
| 30 | R28 | | " " 47kΩ " " | " | | 1 | | |
| 31 | R29 | | " " 10kΩ " " | " | | 1 | | |

| | | |
|---|---|---|
| ISSUE | 1 | B |
| DATE | | 28 July '78 |
| MOD No | | 4877 |

DRAWING No. OK832

ASSEMBLY TITLE: VARACTOR OSCILLATOR CB.

TO BE CHECKED BY MARSHALLED | KIT MARSHALLED ON

FARNELL INSTRUMENTS LTD

SSG 520.

No. OFF | DRAWN PRP | CHECKED

| ITEM No. | REF No. | ORIGIN OF PART | DESCRIPTION | | | | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUED |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | R30 | BOF | RESISTOR | 47Ω | 2% | MULLARD | MR25 | | 1 | | |
| 33 | R31 | " | " | 10kΩ | " | " | " | | 1 | | |
| 34 | R32 | " | " | OMIT | " | " | " | | | | |
| 35 | R33 | " | " | 10kΩ | " | " | " | | 1 | | |
| 36 | R34 | " | " | 3k9Ω | " | " | " | | 1 | | |
| 37 | R35 | " | " | 1kΩ | " | " | " | | 1 | | |
| 38 | R36 | " | " | 1k5 | " | " | " | | 1 | | |
| 39 | R37 | " | " | 47kΩ | " | " | " | | 1 | | |
| 40 | R38 | " | " | 4k7Ω | " | " | " | | 1 | | |
| 41 | R39 | " | " | 10Ω | " | " | " | | 1 | | |
| 42 | R40 | " | " | 10kΩ | " | " | " | | 1 | | |
| 43 | R41 | " | " | OMIT | " | " | " | | | | |
| 44 | R42 | " | " | 1kΩ | " | " | " | | 1 | | |
| 45 | R43 | " | " | 47kΩ | " | " | " | | 1 | | |
| 46 | R44 | " | " | 4k7Ω | " | " | " | | 1 | | |
| 47 | R45 | " | " | 47Ω | " | " | " | | 1 | | |
| 48 | R46 | " | " | 10kΩ | " | " | " | | 1 | | |
| 49 | R47 | " | " | OMIT | " | " | " | | | | |
| 50 | R48 | " | " | 1kΩ | " | " | " | | 1 | | |
| 51 | R49 | " | " | 47kΩ | " | " | " | | 1 | | |
| 52 | R50 | " | " | 4k7Ω | " | " | " | | 1 | | |
| 53 | R51 | " | " | 47Ω | " | " | " | | 1 | | |
| 54 | R52 | " | " | 10kΩ | " | " | " | | 1 | | |
| 55 | R53 | " | " | OMIT | " | " | " | | | | |
| 56 | R54 | " | " | 1kΩ | " | " | " | | 1 | | |
| 57 | R55 | " | " | 47kΩ | " | " | " | | 1 | | |
| 58 | R56 | " | " | 4k7Ω | " | " | " | | 1 | | |
| 59 | R57 | " | " | 47Ω | " | " | " | | 1 | | |
| 60 | R58 | " | " | 10kΩ | " | " | " | | 1 | | |
| 61 | R59 | " | " | OMIT | " | " | " | | | | |
| 62 | R60 | " | " | 18kΩ | " | " | " | | 1 | | |
| 63 | R61 | " | " | 47kΩ | " | " | " | | 1 | | |
| 64 | R62 | " | " | 10kΩ | " | " | " | | 1 | | |
| 65 | R63 | " | " | 47Ω | " | " | " | | 1 | | |
| 66 | R64 | " | " | 10kΩ | " | " | " | | 1 | | |

| | | |
|---|---|---|
| ISSUE | 1 | B |
| DATE | 9 12 77 | 28 July '78 |
| MOD No | [illegible] | 4877 |

| QTY. | — | SHT 3 OF 6 | DWG. 4 | ML 0832013 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: VARACTOR OSCILLATOR CB. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSG520. | No OFF | F 832 | DRAWN PEP | CHECKED

| ITEM No | REF. No | ORIGIN OF PART | DESCRIPTION | | | | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 67 | R65 | BOF | RESISTOR | OMIT | 2% | MULLARD | MR25 | | | | |
| 68 | R66 | " | " | 10kΩ | " | " | " | | 1 | | |
| 69 | R67 | " | " | 2k2Ω | " | " | " | | 1 | | |
| 70 | R68 | " | " | 10kΩ | " | " | " | | 1 | | |
| 71 | R69 | " | " | 10Ω | " | " | " | | 1 | | |
| 72 | R70 | " | " | 22Ω | " | " | " | | 1 | | |
| 73 | R71 | " | " | 22Ω | " | " | " | | 1 | | |
| 74 | | | | | | | | | | | |
| 75 | | | | | | | | | | | |
| 76 | C1 | BOF | CAPACITOR | 470pF | | ERIE | Hi-k 831 | | 1 | | |
| 77 | C2 | " | " | 10pF | | " | NPO/YD | | 1 | | |
| 78 | C3 | " | " | 10pF | | " | " | | 1 | | |
| 79 | C4 | " | " | 10pF | | " | " | | 1 | | |
| 80 | C5 | " | " | OMIT | | | | | | | |
| 81 | C6 | " | " | 1000pF | 500V | ERIE | 831 | | 1 | | |
| 82 | C7 | " | " | 470pF | | " | Hi-k831 | | 1 | | |
| 83 | C8 | " | " | 10pF | | " | NPO/YD | | 1 | | |
| 84 | C9 | " | " | 4.7pF | | " | 861/NPO | | 1 | | |
| 85 | C10 | " | " | 22pF | | " | NPO/YD | | 1 | | |
| 86 | C11 | " | " | 120pF | | ERIE | 861 | | 1 | | |
| 87 | C12 | " | " | 1000pF | 500V | " | 831 | | 1 | | |
| 88 | C13 | " | " | 470pF | | " | Hi-k 831 | | 1 | | |
| 89 | C14 | " | " | 15pF | | | NPO/YD | | 1 | | |
| 90 | C15 | " | " | 4.7pF | | ERIE | 861/NPO | | 1 | | |
| 91 | C16 | " | " | OMIT | | | | | | | |
| 92 | C17 | " | " | 120pF | | ERIE | 861 | | 1 | | |
| 93 | C18 | " | " | 1000pF | 500V | " | 831 | | 1 | | |
| 94 | C19 | " | " | 4700pF | | " | 801/K7004 | | 1 | | |
| 95 | C20 | " | " | 15pF | | " | NPO/YD | | 1 | | |
| 96 | C21 | " | " | 10pF | | " | " | | 1 | | |
| 97 | C22 | " | " | 47pF | | " | N750/YD | | 1 | | |
| 98 | C23 | " | " | 120pF | | " | 861 | | 1 | | |
| 99 | C24 | " | " | 1000pF | 500V | " | 831 | | 1 | | |
| 100 | C25 | " | " | 4700pF | | " | 801/K7004 | | 1 | | |
| 101 | C26 | " | " | 4700pF | | " | " | | 1 | | |

| ISSUE | 1 | B | C | D | E |
|---|---|---|---|---|---|
| DATE | [illegible] | 7-4-78 | 2.5.78. | 20.6.78 | 15 Jan'79 |
| MOD No | [illegible] | 4514 | 4680 | 4745 | 5243 |

| QTY. | — | SHT 4 OF 6 | DWG 4 | ML 0832013 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: VARACTOR OSCILLATOR CB. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSG 520. | No. DES. = 832 | DRAWN REP | CHECKED

| ITEM No | REF. No | ORIGIN OF PART | DESCRIPTION | | | PART No | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUE |
|---|---|---|---|---|---|---|---|---|---|---|
| 102 | C27 | BOF | CAPACITOR | 22PF | ERIE | NPO/YD | | 1 | | |
| 103 | C28 | " | " | 18PF | " | " | | 1 | | |
| 104 | C29 | " | " | 220PF | " | 831 | | 1 | | |
| 105 | C30 | " | " | 120PF | ERIE | 861 | | 1 | | |
| 106 | C31 | " | " | 1000PF 500V | " | 831 | | 1 | | |
| 107 | C32 | " | " | 4700PF | " | 801/K7004 | | 1 | | |
| 108 | C33 | " | " | 470PF | " | Hi_k 831 | | 1 | | |
| 109 | C34 | " | " | 22PF | " | NPO/YD | | 1 | | |
| 110 | C35 | " | " | 15PF | " | " | | 1 | | |
| 111 | C36 | " | " | 5.6PF | " | ALT. N470-86P 861/NPO | | 1 | | |
| 112 | C37 | " | " | OMIT | | | | | | |
| 113 | C38 | " | " | 1000PF 500V | ERIE | 831 | | 1 | | |
| 114 | C39 | " | " | 470PF | " | Hi_k 831 | | 1 | | |
| 115 | C40 | " | " | 10PF | " | NPO/YD | | 1 | | |
| 116 | C41 | " | " | 10PF | " | " | | 1 | | |
| 117 | C42 | " | " | OMIT | | | | | | |
| 118 | C43 | " | " | 120PF | ERIE | 861 | | 1 | | |
| 119 | C44 | " | " | 1000PF 500V | " | 831 | | 1 | | |
| 120 | C45 | " | " | 470PF | " | Hi_k 831 | | 1 | | |
| 121 | C46 | " | " | 15PF | " | NPO/YD | | 1 | | |
| 122 | C47 | " | " | 4.7PF | " | 861/NPO | | 1 | | |
| 123 | C48 | " | " | OMIT | | | | | | |
| 124 | C49 | " | " | 120PF | ERIE | 861 | | 1 | | |
| 125 | C50 | " | " | 1000PF 500V | " | 831 | | 1 | | |
| 126 | C51 | " | " | 470PF | " | Hi_k 831 | | 1 | | |
| 127 | C52 | " | " | 15PF | " | NPO/YD | | 1 | | |
| 128 | C53 | " | " | 10PF | " | " | | 1 | | |
| 129 | C54 | " | " | 47PF | " | N750/YD | | 1 | | |
| 130 | C55 | " | " | 120PF | " | 861 | | 1 | | |
| 131 | C56 | " | " | 1000PF 500V | " | 831 | | 1 | | |
| 132 | C57 | " | " | 4700PF | " | 801/K7004 | | 1 | | |
| 133 | C58 | " | " | 22PF | " | NPO/YD | | 1 | | |
| 134 | C59 | " | " | 15PF | " | " | | 1 | | |
| 135 | C60 | " | " | 100PF | " | N1500/801 | | 1 | | |
| 136 | C61 | " | " | 120PF | " | 861 | | | | |

| ISSUE | 1 |
|---|---|
| DATE | 9 12 77 |
| MOD. No | 1107 |

| QTY | - | SHT 5 OF 6 | DWG 4 | ML 0832013 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: VARACTOR OSCILLATOR CB. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

| FARNELL INSTRUMENTS LTD | No. OFF | | DRAWN | CHECKED |
|---|---|---|---|---|
| SSC 520. | | 832 | PEP | |

| ITEM No. | REF No. | ORIGIN OF PART | DESCRIPTION | PART No. | ISSUE | QUANTITY PER | TOTAL | ISSUE |
|---|---|---|---|---|---|---|---|---|
| 137 | C62 | BOF | CAPACITOR 1000 PF 500V ERIE | 831 | | 1 | | |
| 138 | C63 | " | " 4700 PF " | 801/K7004 | | 1 | | |
| 139 | C64 | " | " 1000 PF 500V " | 831 | | 1 | | |
| 140 | C65 | " | " 1000 PF 500V " | " | | 1 | | |
| 141 | C66 | " | " 4700 PF " | 801/K7004 | | 1 | | |
| 142 | C67 | " | " 4700 PF " | " | | 1 | | |
| 143 | C68 | " | " 1000 PF 500V " | 831 | | 1 | | |
| 144 | C69 | " | " 4.7 PF " | 861/NPO | | 1 | | |
| 145 | C70 | " | " 4700 PF " | 801/K7004 | | 1 | | |
| 146 | C1 | " | " 4700 PF " | " | | 1 | | |
| 147 | C72 | " | " 4700 PF " | " | | 1 | | |
| 148 | C73 | " | " 4700 PF " | " | | 1 | | |
| 149 | C74 | " | " 4700 PF " | " | | 1 | | |
| 150 | | | | | | | | |
| 151 | | | | | | | | |
| 152 | | BOF | D.1.2.4.5.7.8.10.11.12.13.15.16.17.18.20.21.23.24.26.27.29.30 32.33.34.35. VARACTOR DIODE THOMPSON CSF ONLY | BB105B | | 26 | | |
| 153 | | BOF | D3.6.9.14.19.22.25.28.31.36.37. PIN DIODE H.P. | 5082_3168 | | 11 | | |
| 154 | | | | | | | | |
| 155 | | | | | | | | |
| 156 | | | | | | | | |
| 157 | | BOF | VT. 1.2.3.4.5.7.8.9.10 TRANSISTOR TEXAS ONLY | 2N5245 | | 9 | | |
| 158 | VT6 | BOF | " SILICONIX | W245B | | 1 | | |
| 159 | | | | | | | | |
| 160 | | | | | | | | |
| 161 | | | | | | | | |
| 162 | | | | | | | | |
| 163 | | | | | | | | |
| 164 | | | | | | | | |
| 165 | | | | | | | | |
| 166 | | | | | | | | |
| 167 | | | | | | | | |

| ISSUE | 1 | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| DATE | | 28.4.78 | 21.6.78 | 21-7-78 | 17.11.78 | 12JAN79 | 5.3.79 |
| MOD No. | | 4680 | Q4745 | Q4693 | Q5047 | 5196 | 5395 |

| QTY. | — | SHT. 6 OF 6 | DWG. 4 | ML 0832013 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: VARACTOR OSCILLATOR CB. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSC 520. | No. OFF | F 832 | DRAWN PEP | CHECKED

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUE |
|---|---|---|---|---|---|---|---|---|
| 168 | | BOF | L1.3.5.9.11.13.15. | | | | | |
| | | | CHOKE 15mH. | SC10 | | 7 | | |
| 169 | | B1 | TRANSISTOR PADS | TW1A | | 9 | | |
| 170 | L8 | F1 | COIL FORMER 2175-2-3 CORE RED | 3ZQ0832301 | | 1 | | |
| 171 | L17 | " | " " 2175-1-3 " YELLOW | 3ZQ0832302 | | 1 | | |
| 172 | L7 | " | " " 2175-1-3 " " | 3ZQ0832303 | | 1 | | |
| 173 | L16 | " | " " 2175-3-3 " GREEN | 3ZQ0832304 | | 1 | | |
| 174 | L6 | " | " " 2175-3-3 " " | 3ZQ0832305 | | 1 | | |
| 175 | L14 | " | " " 2175-3-3 " " | 3ZQ0832306 | | 1 | | |
| 176 | L4 | " | " " 2175-5-3 " BRASS | 3ZQ0832307 | | 1 | | |
| 177 | L12 | " | " " 2175-5-3 " " | 3ZQ0832308 | | 1 | | |
| 178 | L2 | " | " " 2175-5-3 " " | 3ZQ0832309 | | 1 | | |
| 179 | L10 | " | " " 2175-5-3 " " | 3ZQ0832310 | | 1 | | |
| 180 | | BOF | M3 X 6 NYLON CHEESEHEAD, NYLONIC ROUND HEAD SCREW | | | 2 | | |
| 181 | | " | M3 X 12 SPACER HEX. HARWIN | R6075 | | 2 | | |

| ISSUE | 1 | A | B |
|---|---|---|---|
| DATE | [illegible] | 21-7-78 | 3/10/78 |
| MOD No | | 9693 | 24962 |

| QTY | — | SHT. 1 OF 3 | DWG. 4 | ML 0832014 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: AM. MODULATOR / OUTPUT AMP CB. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSG 520 | No. OFF | F 832 | DRAWN PEP | CHECKED

| ITEM No. | REF No. | ORIGIN OF PART | DESCRIPTION | PART No. | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|
| 1 | | BOF | CIRCUIT BOARD MASTER | 2220832104 2 | | 1 | | |
| | | | " " DRILLING | 2220832105 | | REF | | |
| | | | " " SCREEN | 2220832106 | | REF | | |
| | | | " " RESIST SCREEN | 2220832107 | | REF | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | R1 | BOF | RESISTOR 180Ω 2% MULLARD | MR25 | | 1 | | |
| 5 | R2 | " | " 6k8Ω " " | " | | 1 | | |
| 6 | R3 | " | " 1kΩ " " | " | | 1 | | |
| 7 | R4 | " | " 22Ω " " | " | | 1 | | |
| 8 | R5 | " | " 10kΩ " " | " | | 1 | | |
| 9 | R6 | " | " 15kΩ " " | " | | 1 | | |
| 10 | R7_R9 | " | " 1kΩ " " | " | | 3 | | |
| 11 | R10 | " | " 10Ω " " | " | | 1 | | |
| 12 | R11 | " | " 5k6Ω " " | " | | 1 | | |
| 13 | R12 | " | " 4k7Ω " " | " | | 1 | | |
| 14 | R13 | " | " 15kΩ " " | " | | 1 | | |
| 15 | R14 | " | " 1kΩ " " | " | | 1 | | |
| 16 | R15 | " | " 820Ω " " | " | | 1 | | |
| 17 | R16 | " | " 1kΩ " " | " | | 1 | | |
| 18 | R17 | " | " 56kΩ " " | " | | 1 | | |
| 19 | R18 | " | " 1k8Ω " " | " | | 1 | | |
| 20 | R19 | " | " 270Ω " " | " | | 1 | | |
| 21 | R20 | " | " 1kΩ " " | " | | 1 | | |
| 22 | R21 | " | " OMIT " " | " | | 1 | | |
| 23 | R22 | " | " 68kΩ " " | " | | 1 | | |
| 24 | R23 | " | " 1k8Ω " " | " | | 1 | | |
| 25 | R24 | " | " 68Ω " " | " | | 1 | | |
| 26 | R25 | " | " 56kΩ " " | " | | 1 | | |
| 27 | R26 | " | " 220Ω " " | " | | 1 | | |
| 28 | R27 | " | " 470Ω " " | " | | 1 | | |
| 29 | R28 | " | " 220Ω " " | " | | 1 | | |
| 30 | R29 | " | " 10MΩ " " | CR25 | | 1 | | |
| 31 | R30 | " | " 4k7Ω " " | MR25 | | 1 | | |
| 32 | R31 | " | " 680Ω " " | MR30 | | 1 | | |

| ISSUE | | B | C |
|---|---|---|---|
| DATE | | 28 July 78 | 8-11-78 |
| MOD. No | | 4877 | Q 5067 |

| QTY. | — | SHT. 2 OF 3 | DWG. 4 | ML 0832014 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: AM. MODULATOR / OUTPUT AMP CB. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSG 520. | No. OFF | F 832 | DRAWN REP | CHECKED

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | PART No | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|
| 33 | R32 | BOF | RESISTOR 470Ω 2% MULLARD | MR25 | | 1 | | |
| 34 | R33.34 | " | " 1k8Ω " " | " | | 2 | | |
| 35 | R35 | " | " 10kΩ " " | " | | 1 | | |
| 36 | R37 | " | " 10Ω " " | " | | 1 | | |
| 37 | R36 | " | " 8k2Ω " " | " | | 1 | | |
| 38 | R38 | " | " 270kΩ " ELECTROSIL | TR4 | | 1 | | |
| 39 | | | | | | | | |
| 40 | C1 | BOF | CAPACITOR 22uf 25V ITT | TAG 22/25 | | 1 | | |
| 41 | C2 | " | " 470Pf 500V ERIE | 831 | | 1 | | |
| 42 | C3 | " | " 1.5Pf 500V " | 861 | | 1 | | |
| 43 | C4 | " | " 180Pf 500V " | 831 | | 1 | | |
| 44 | C5 | " | " 4700Pf " | 801/K7004 | | 1 | | |
| 45 | | | | | | 1 | | |
| 46 | C7 | " | " 180Pf 500V " | 831 | | 1 | | |
| 47 | C8 | " | " 0.1uf 30V " | 811T | | 1 | | |
| 48 | C9 | " | " 1.5Pf 500V " | 861 | | 1 | | |
| 49 | C10 | " | " 1000Pf 500V " | 861/K7004 | | 1 | | |
| 50 | C11,12 | " | " 470Pf 500V " | 831 | | 2 | | |
| 51 | C13 | " | " 0.1uf 30V " | 811T | | 1 | | |
| 52 | C14 | " | " 470Pf 500V " | 831 | | 1 | | |
| 53 | C15 | " | " 15Pf 200V " | NPO/YD | | 1 | | |
| 54 | C16 | " | " 0.1uf 30V " | 811T | | 1 | | |
| 55 | C17 | " | " 470Pf 500V " | 831 | | 1 | | |
| 56 | C18 | " | " 22uf 25V ITT | TAG 22/25 | | 1 | | |
| 57 | C19 | " | " 3.3Pf 500V ERIE | 861/NPO | | 1 | | |
| 58 | C20 | " | " 3.3Pf " " | " | | 1 | | |
| 59 | C21 | " | " 470Pf " " | 831 | | 1 | | |
| 60 | C22 | " | " 0.1uf 30V | 811T | | 1 | | |
| 61 | C23 | " | " 120Pf 500V ERIE | 861/N4700 | | 1 | | |
| 62 | C24 | " | " 470Pf 500V " | 831 | | 1 | | |
| 63 | C25 | " | " 0.047uf 250V MILLARD | C280/AE | | 1 | | |
| 64 | C26,27 | " | " 4700Pf ERIE | MONOBLOC REDCAP 8121 M | | 2 | | |
| 65 | C28 | " | " 10uf 50V ITT | TAG 10/50 | | 1 | | |
| 66 | C29 | " | " 4700Pf ERIE | MONOBLOC REDCAP 8121 M | | 1 | | |
| 67 | C30 | " | " 4.7pF " | 861/NPO | | 1 | | |

| ISSUE | | B | C | D | E | F |
|---|---|---|---|---|---|---|
| DATE | 11-2-77 | 10-4-78 | 12-4-78 | 20676 | 4 Aug 78 | 6 Oct 78 |
| MOD. No | 4107 | 4621 | 4646 | 4745 | 4985 | 4965 |

| QTY. | — | SHT 3 OF 3 | DWG 4 | ML 0832014 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: AM. MODULATOR /OUTPUT AMP CB | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSC 520. | No. OFF | = 832 | DRAWN PEP | CHECKED

| ITEM No | REF No | ORIGIN OF PART | DESCRIPTION | | PART No. | | ISSUE | QUANTITY PER | QUANTITY TOTAL | ISSUE |
|---|---|---|---|---|---|---|---|---|---|---|
| 68 | C31 | BOF | CAPACITOR | 470 pF | ERIE | 831 | | 1 | | |
| 69 | | | | | | | | | | |
| 70 | D1_D4 | BOF | DIODE | | H.P. | 5082_3080 | | 4 | | |
| 71 | D5_D6 | " | " | | " | 5082_2835 | | 2 | | |
| 72 | D7_D8 | " | " | | TEXAS | IN4148 | | 2 | | |
| 73 | | | | | | | | | | |
| 74 | P1 | BOF | POTENTIOMETER | 25kΩ | BECKMAN | 72P | | 1 | | |
| 75 | P2 | " | " | 10kΩ | " | 72P | | 1 | | |
| 76 | | | | | | | | | | |
| 77 | | | | | | | | | | |
| 78 | VT1,3,4 | BOF | TRANSISTOR | | MOTOROLA (ONLY) | BFR90 | | 3 | | |
| 79 | VT2 | " | " | (WITH PAD) | TEXAS | BC182L | | 1 | | |
| 80 | | | | | | | | | | |
| 81 | | | | | | | | | | |
| 82 | IC1 * | BOF | INTEGRATED CIRCUIT | | RCA | CA3130E | | 1 | | |
| 83 | | " | IC. SOCKET | 8 WAY | CAMBION | 703_4008_01_04.12 | | 1 | | |
| 84 | | | | | | | | | | |
| 85 | | | | | | | | | | |
| 86 | L1.2.3 | BOF | CHOKE 2 | | WOUND OF FX1115 | 32Q0832312 | | 3 | | |
| 87 | L4.5.6. | BOF | " | 1 | " " " | 32G0832311 | | 3 | | |
| 88 | | | | | | | | | | |
| 89 | | | | | | | | | | |
| 90 | | BOF | FEEDTHRO' | 1750 PF | ERIE | 1214_001 | | 2 | | |
| 91 | | | | | | | | | | |
| 92 | | F1 | SCREENING BOX | | | 4C30832249 | | 1 | | |
| 93 | | | | | | | | | | |
| 94 | | | | | | | | | | |
| 95 | | | | | | | | | | |
| 96 | | B1 | CB. PIN | | TUCKER | | | 2 | | |
| 97 | | B1 | TRANSISTOR PAD | | | 10218 | | 1 | | |
| 98 | | | | | | | | | | |
| 99 | | | | | | | | | | |
| 100 | | | | | | | | | | |
| 101 | | | | | | | | | | |
| 102 | | * | IC MUST NOT BE REMOVED FROM HOLDER EXCEPT WITH INSERTION TOOL | | | | | | | |

| ISSUE | A | B | C | D | E |
|---|---|---|---|---|---|
| DATE | | 26.4.78 | 20.6.78 | 21-7-78 | 3/10/78 |
| MOD No | ~ | 4676 | a 4745 | Q4693 | Q4962 |

| QTY | SHT 1 OF 3 | DWG 4 | ML 0832015 |
|---|---|---|---|
| USED ON UK832 | ASSEMBLY TITLE: AGC. / RANGE DECODER CB. | | |
| | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSC 520. | No. DES. | F 832 | DRAWN PEP | CHECKED

| ITEM No | REF No | ORIENTATE PART | DESCRIPTION | | | | PART No | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | BOF | CIRCUIT BOARD | MASTER | | | 2220832136 | 2 | 1 | | |
| | | " | " | DRILLING | | | 2220832137 | | REF | | |
| | | " | " | SCREEN | | | 2220832138 | | REF | | |
| | | " | " | SOLDER RESIST SCREEN | | | 2220832139 | | REF | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | R1 | BOF | RESISTOR | 100Ω | 2% | MULLARD | MR25 | | 1 | | |
| 5 | R2 | " | " | 820Ω | " | " | " | | 1 | | |
| 6 | R3 | " | " | 1kΩ | " | " | " | | 1 | | |
| 7 | R4 | " | " | 470Ω | " | " | " | | 1 | | |
| 8 | R5 | " | " | 18kΩ | " | " | " | | 1 | | |
| 9 | R6 | " | " | 1k8Ω | " | " | " | | 1 | | |
| 10 | R7 | " | " | 56Ω | " | " | " | | 1 | | |
| 11 | R8 | " | " | 10kΩ | " | " | " | | 1 | | |
| 12 | R9 | " | " | 220Ω | " | " | " | | 1 | | |
| 13 | R10 | " | " | 4k7Ω | " | " | " | | 1 | | |
| 14 | R11 | " | " | 680Ω | " | " | MR30 | | 1 | | |
| 15 | R12 | " | " | 10kΩ | " | " | MR25 | | 1 | | |
| 16 | R13 | " | " | 10kΩ | " | " | " | | 1 | | |
| 17 | R14 | " | " | 33kΩ | " | " | " | | 1 | | |
| 18 | R15 | " | " | 33kΩ | " | " | " | | 1 | | |
| 19 | R16 | " | " | 47kΩ | " | " | " | | 1 | | |
| 20 | R17_19 | " | " | 10kΩ | " | " | " | | 3 | | |
| 21 | R20_41 | " | " | 47kΩ | " | " | " | | 22 | | |
| 22 | R42_52 | " | " | 10kΩ | " | " | " | | 11 | | |
| 23 | R53 | " | " | 2k2Ω | " | " | " | | 1 | | |
| 24 | R54 | " | " | 390Ω | " | " | " | | 1 | | |
| 25 | R55 | " | " | 560kΩ | " | " | CR25 | | 1 | | |
| 26 | R56 | " | " | 10Ω | " | " | MR25 | | 1 | | |
| 27 | | | | | | | | | | | |
| 28 | | | | | | | | | | | |
| 29 | | | | | | | | | | | |
| R30 | C1_C3 | BOF | CAPACITOR | 470pf | 500V | ERIE | 831 | | 3 | | |
| 31 | C4 | " | " | 0.1uf | 30V | " | 811T | | 1 | | |
| 32 | C5 | " | " | 10kpf | 25V | " | 861 | | 1 | | |

| ISSUE | A |
|---|---|
| DATE | |
| MOD No | |

| QTY. | — | SHT 2 OF 3 | DWG 4 | ML 0832015 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: AGC / RANGE DECODER CB. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSG 520. | No OFF | F 832 | DRAWN PEP | CHECKED

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | | | PART No | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|---|---|
| 33 | C6 | BOF | CAPACITOR | 0.1uf 30V | ERIE | 811T | | 1 | | |
| 34 | C7 | " | " | 5.6pf 500V | " ALT. | N470B61 861/NPO | | 1 | | |
| 34 | C8 | " | " | 470pf 500V | " | 831 | | 1 | | |
| 36 | C9 | " | " | 0.47uf 63V | ADVANCE ALT. | A2847IIA. MD10A | | 1 | | |
| 37 | C10 | " | " | 180pf 500V | ERIE | 861/N5600 | | 1 | | |
| 38 | C11 | " | " | 0.1uf 30V | " | 811T | | 1 | | |
| 39 | C12-14 | " | " | 4700pf | " | MONOBLOC REDCAP 8121 M | | 3 | | |
| 40 | C15 | " | " | 10uf 50V | ITT | TAG 10/50 | | 1 | | |
| 41 | C16 | " | " | 120pf 200V | ERIE | SN/1100/YD. | | 1 | | |
| 42 | C17 | " | " | 0.1uf 30V | " | 811T | | 1 | | |
| 43 | C18 | " | " | 22uf 25V | ITT | TAG.22/25 | | 1 | | |
| 44 | C19 | " | " | OMIT | | | | 1 | | |
| 45 | C20 | " | " | 10pf | ERIE | NPO/YD | | 1 | | |
| 46 | | " | | | | | | | | |
| 47 | | | | | | | | | | |
| 48 | | | | | | | | | | |
| 49 | | | | | | | | | | |
| 50 | L1-L3 | BOF | CHOKE | WOUND ON FX 115 | | 32Q0832311 | | 3 | | |
| 51 | P1 | BOF | POTENTIOMETER | 10kΩ | BECKMAN | 72P | | 1 | | |
| 52 | | | | | | | | | | |
| 53 | | | | | | | | | | |
| 54 | | | | | | | | | | |
| 55 | VT1-2 | BOF | TRANSISTOR | | MOTOROLA (ONLY) | BFR90 | | 2 | | |
| 56 | VT3-15 | " | " | (WITH PADS) | TEXAS | BC182L | | 13 | | |
| 57 | VT16-26 | " | " | | " | BC212L | | 11 | | |
| 58 | | | | | | | | | | |
| 59 | | | | | | | | | | |
| 60 | | | | | | | | | | |
| 61 | IC1 | BOF* | INTEGRATED CIRCUIT | | RCA. | CA3130E | | 1 | | |
| 62 | IC2-3 | " * | " | | MOTOROLA | MC14028 | | 2 | | |
| 64 | | " | IC. SOCKET | 16 WAY | VERO | 703-4016-01-04-12 | | 2 | | |
| 65 | | " | " | 8 WAY | " | 703-4008-01-04-12 | | 1 | | |
| 66 | | | | | | — | | | | |
| 67 | | NOTE | HEF ICs MUST NOT BE USED ON THIS C'B. | | | | | | | |
| 68 | | * | IC MUST NOT BE REMOVED FROM HOLDER EXCEPT WITH INSERTION TOOL | | | | | | | |

| ISSUE | A | B | C | D | E |
|---|---|---|---|---|---|
| DATE | | 20-6-78 | 21-7-78 | A Aug'78 | 3/10/78 |
| MOD. No | | Q4745 | Q4603 | 4903 | Q4962 |

| QTY | — | SHT. 3 OF 3 | DWG. 4 | ML 0832015 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: AGC / RANGE DECODER CB. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSG 520 | No OFF | F 832 | DRAWN PEP | CHECKED

| ITEM No | REF No | ORIGIN OF PART | DESCRIPTION | | PART No. | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|---|
| 60 | D1 | BDF | DIODE | HP | 5082-3080 | | 1 | | |
| 70 | D2-D3 | " | " | " | 5082-2835 | | 2 | | |
| 71 | D4-D7 | " | " | TEXAS. | IN4148 | | 4 | | |
| 72 | | | | | | | | | |
| 73 | | | | | | | | | |
| 74 | | | | | | | | | |
| 75 | | | | | | | | | |
| 76 | | B1 | CB. PIN | TUCKER | | | | | |
| 77 | | B1 | TRANSISTOR PAD | | 10218 | | 24 | | |
| 78 | | | | | | | | | |
| 79 | | | | | | | | | |
| 80 | | | | | | | | | |

| ISSUE | A |
|---|---|
| DATE | |
| MOD No | ~ |

| | | | | |
|---|---|---|---|---|
| – | | 1 3 | | ML 0832016 |
| UK832 | ASSEMBLY TITLE: PRESCALER AND BUFFER AMP. CB. | | | |
| FARNELL INSTRUMENTS LTD. SSC. 520 | No. OFF | F 832 | DRAWN PEP | |

| ITEM | REF No. | ORIGIN OF PART | DESCRIPTION | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUED |
|---|---|---|---|---|---|---|---|---|
| 1 | | BOF | CIRCUIT BOARD MASTER | 2220832108 1/2 | | 1 | | |
| | | | " " DRILLING | 2220832109 | | REF | | |
| | | | " " SCREEN | 2220832110 | | REF | | |
| | | | " " SOLDER RESIST SCREEN | 2220832111 | | REF | | |
| 2 | | | | | | | | |
| 3 | | F1 | FEED THRO WASHER | 4CS0832231 | | 14 | | |
| 4 | R1 | BOF | RESISTOR 56Ω 2% MULLARD | MR25 | | 1 | | |
| 5 | R2 | " | " 820Ω " " | " | | 1 | | |
| 6 | R3 | " | " 1kΩ " " | " | | 1 | | |
| 7 | R4 | " | " NOT FITTED " " | " | | | | |
| 8 | R5 | " | " 2k2Ω " " | " | | 1 | | |
| 9 | R6 | " | " 18kΩ " " | " | | 1 | | |
| 10 | R7 | " | " 470Ω " " | " | | 1 | | |
| 11 | R8 | " | " 1k8Ω " " | " | | 1 | | |
| 12 | R9 | " | " 56Ω " " | " | | 1 | | |
| 13 | R10 | " | " 4K7 " " | " | | 1 | | |
| 14 | R11 | " | " 390Ω " " | " | | 1 | | |
| 15 | R12 | " | " 10kΩ " " | " | | 1 | | |
| 16 | R13 | " | " 4k7Ω " " | " | | 1 | | |
| 17 | R14 | " | " 220Ω " " | " | | 1 | | |
| 18 | R15 | " | " 680Ω " " | MR30 | | 1 | | |
| 19 | R16 | " | " 560kΩ " " | CR25 | | 1 | | |
| 20 | R17 | " | " 10kΩ " " | MR25 | | 1 | | |
| 21 | R18 | " | " 8k2Ω " " | " | | 1 | | |
| 22 | R19 | " | " 33kΩ " " | " | | 1 | | |
| 23 | R20 | " | " 33kΩ " " | " | | 1 | | |
| 24 | R21 | " | " 100Ω " " | " | | 1 | | |
| 25 | R22 | " | " 100Ω " " | " | | 1 | | |
| 26 | R23 | " | " 100Ω " " | " | | 1 | | |
| 27 | R24 | " | " 100Ω " " | " | | 1 | | |
| 28 | R25 | " | " 100Ω " " | " | | 1 | | |
| 29 | R26 | " | " 180Ω " " | " | | 1 | | |
| 30 | R27 | " | " 270Ω " " | " | | 1 | | |
| 31 | R28 | " | " 820Ω " " | " | | 1 | | |
| 32 | R29 | " | " 10kΩ " " | " | | 1 | | |

| ISSUE | A | B |
|---|---|---|
| | | 28 July '78 |
| | | 4877 |

| QTY | – | SHT. 2 OF 3 | DWG. 4 | ML 0832016 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: PRESCALER & BUFFER AMP. CB. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSG520. | No. OFF | F832 | DRAWN PEP | CHECKED

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | PART No. | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|
| 33 | R30 | BOF | RESISTOR 10kΩ 2% MULLARD | MR25 | | 1 | | |
| 34 | R31 | " | " 560Ω " " | " | | 1 | | |
| 35 | R32 | " | " 330Ω " " | " | | 1 | | |
| 36 | R33_36 | " | " 560Ω " " | " | | 4 | | |
| 37 | R37_38 | " | " 100Ω " " | " | | 2 | | |
| 38 | R39_40 | " | " 10Ω " " | " | | 2 | | |
| 39 | R41 | " | " 100Ω " " | " | | 1 | | |
| 40 | R42 | " | " 560Ω " " | " | | 1 | | |
| 41 | R43 | " | " 1kΩ " " | " | | 1 | | |
| 42 | R44 | " | " 2k2Ω " " | " | | 1 | | |
| 43 | R45_48 | " | " 100kΩ " " | " | | 4 | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | C1_3 | BOF | CAPACITOR 470pF 500V ERIE | 831 | | 3 | | |
| 48 | C4 | " | " 0.1μF 30V " | 811T | | 1 | | |
| 49 | C5 | " | " 10kpF 25V " | 861 | | 1 | | |
| 50 | C6 | " | " 0.1μF 30V " | 811T | | 1 | | |
| 51 | C7 | " | " 10 pF 500V " | 861 ONLY | | 1 | | |
| 52 | C8 | " | " 470pF 500V " | 831 | | 1 | | |
| 53 | C9 | " | " 180pF " " | 861/N5600 | | 1 | | |
| 54 | C10 | " | " 0.47μF 63V ALT ADVANCE | ARB4711A. MD10A | | 1 | | |
| 55 | C11 | " | " 120pF 200V ERIE | SN1100/YD | | 1 | | |
| 56 | C12 | " | " 0.1μF 30V " | 811T | | 1 | | |
| 57 | C13 | " | " 4700pF 100V " | MONOBLOC REDCAP 8121 M | | 1 | | |
| 58 | C14 | " | " 22μF 25V MULLARD | 015_16229 | | 1 | | |
| 59 | C15 | " | " 4700pF 100V ERIE | MONOBLOC REDCAP 8121 M | | 1 | | |
| 60 | C16 | " | " 4700pF 100V " | " | | 1 | | |
| 61 | C17 | " | " 10kpF 25V " | 861 | | 1 | | |
| 62 | C18 | " | " ·01 μF 100V WIMA | FKS2 MIN. | | 1 | | |
| 63 | C19 | " | " 0.047μF 100V " | FKS3 | | 1 | | |
| 64 | C20 | " | " 1000pF 500V ERIE | 831 | | 1 | | |
| 65 | C21 | " | " 47μF 10V MULLARD | 015_14479 | | 1 | | |
| 66 | C22_24 | " | " 0.047μF 100V WIMA | FKS3 | | 3 | | |
| 67 | | | | | | | | |

| ISSUE | A | B | C | D |
|---|---|---|---|---|
| DATE | | 26.5.78 | 28 July 78 | 18-11-78 |
| MOD. No | ~ | 4693 | 4877 | Q5099 |

| QTY. | – | SHT. 3 OF 3 | DWG. 4 | ML 0832016 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: PRESCALER & BUFFER AMP. CB. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSG 520. | No. OFF | F 832 | DRAWN PEP | CHECKED

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUE |
|---|---|---|---|---|---|---|---|---|---|
| 68 | * | | IC MUST NOT BE REMOVED FROM HOLDER EXCEPT WITH INSERTION TOOL | | | | | | |
| 69 | | | | | | | | | |
| 70 | | | | | | | | | |
| 71 | D1 | BOF | DIODE | H.P. | 5082_3080 | | 1 | | |
| 72 | D2_D3 | " | " | " | 5082_2835 | | 2 | | |
| 73 | D4 | " | " | | OA47 | | 1 | | |
| 74 | | | | | | | | | |
| 75 | | | | | | | | | |
| 76 | | | | | | | | | |
| 77 | VT1_3 | BOF | TRANSISTOR | MOTOROLA (ONLY) | BFR90 | | 2 | | |
| 78 | VT2_4 | " | " (WITH PAD) | TEXAS | BC182L | | 2 | | |
| 79 | | | | | | | | | |
| 80 | | | | | | | | | |
| 81 | | | NOTE. HEF ICs MUST NOT BE USED ON THIS C'B. | | | | | | |
| 82 | IC1 * | BOF | INTEGRATED CIRCUIT | | CA3130E | | 1 | | |
| 83 | IC2 * | " | " " | MOTOROLA (ONLY) | MC12013 | | 1 | | |
| 84 | IC3 * | " | " " | " | MC10137 | | 1 | | |
| 85 | IC4 * | " | " " | " | MC10109 | | 1 | | |
| 86 | IC5 * | " | " " | " | MC10131 | | 1 | | |
| 87 | IC6 * | " | " " | TEXAS | SN7474 | | 1 | | |
| 88 | IC7 * | " | " " | MOTOROLA (ONLY) | MC12013 | | 1 | | |
| 89 | IC8 * | " | " " | TEXAS | SN74190 | | 1 | | |
| 90 | | " | IC. SOCKET 8WAY | CAMBION | 703_4008_01_04_12 | | 1 | | |
| 91 | | " | " " 14 WAY | " | 703_4014_01_04_12 | | 1 | | |
| 92 | | " | " " 16 WAY | " | 703_4016_01_04_12 | | 2 | | |
| 93 | | " | FIBRE WASHER 6BA X 1/32" | | | | 1 | | |
| 94 | | " | M3 X 6mm HEX SPACER HARWIN | | | | 1 | | |
| 95 | P1 | BOF | POTENTIOMETER 10kΩ | BECKMAN | 72P | | 1 | | |
| 96 | L1_L3 | BOF | CHOKE 1 WOUND ON FX1.15 | | 5ZQ0832311 | | 3 | | |
| 97 | L4 | BOF | " 1mH | | SC10 | | 1 | | |
| 98 | | | | | | | | | |
| 99 | | " | DISCOIDAL FEEDTHRU 1000PF | ERIE | CDFT 100 | | 14 | | |
| 100 | | " | COAXITUBE | SELECTRO | UT85 | | 6" | | |
| 101 | | B1 | CB. PIN | TUCKER | MR15100 | | 5 | | |
| 102 | | B1 | TRANSISTOR PAD | | 10218 | | 2 | | |

| ISSUE | A | B | C | D |
|---|---|---|---|---|
| DATE | | 21-7-78 | 31 July 78 | 3/10/78 |
| MOD. No | ~ | Q4603 | 4877 | Q4962 |

| QTY | — | SHT. 1 OF 3 | DWG. 4 | ML 0832017 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: SYNTHESIZER CB. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

| FARNELL INSTRUMENTS LTD | No. OF | | DRAWN | CHECKED |
|---|---|---|---|---|
| SSC 520 | | 832 | PEP. | |

| ITEM No | REF No | ORIGIN OF PART | DESCRIPTION | | | | PART No | ISSUE | QUANTITY PER | TOTAL | ISSUE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | BOF | CIRCUIT BOARD | MASTER | | | 2220832112 1/2 | | 1 | | |
| | | | | DRILLING | | | 2220832113 | | REF | | |
| | | | | SCREEN | | | 2220832114 | | REF | | |
| | | | | SOLDER RESIST SCREEN | | | 2220832115 | | REF | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | R1_R20 | BOF | RESISTOR | 100kΩ | 2% | MULLARD | MR25 | | 20 | | |
| 5 | R21 | " | " | 47Ω | " | " | " | | 1 | | |
| 6 | R22 | " | " | 330Ω | " | " | " | | 1 | | |
| 7 | R23 | " | " | 1kΩ | " | " | " | | 1 | | |
| 8 | R24 | " | " | 47Ω | " | " | " | | 1 | | |
| 9 | R25_26 | " | " | 100kΩ | " | " | " | | 2 | | |
| 10 | R28 | " | " | 100kΩ | " | " | " | | 1 | | |
| 11 | R29 | " | " | 10kΩ | " | " | " | | 1 | | |
| 12 | R30 | " | " | 1MΩ | " | " | CR25 | | 1 | | |
| 13 | R31 | " | " | OMIT | " | " | MR25 | | 1 | | |
| 14 | R32 | " | " | 1kΩ | " | " | " | | 1 | | |
| 15 | R33 | " | " | 560kΩ | " | " | MR30 | | 1 | | |
| 16 | R34 | " | " | 10MΩ | " | " | CR25 | | 1 | | |
| 17 | R35 | " | " | 18kΩ | " | " | MR25 | | 1 | | |
| 18 | R36 | " | " | 820kΩ | " | " | MR30 | | 1 | | |
| 19 | R37 | " | " | 10kΩ | " | " | MR25 | | 1 | | |
| 20 | R38 | " | " | OMIT | " | " | | | | | |
| 21 | R39 | " | " | T.C. LINK. | | | | | | | |
| 22 | R40 | " | " | 10Ω | 2% | MULLARD | MR25 | | 1 | | |
| 23 | R41 | " | " | 150kΩ | " | " | " | | 1 | | |
| 24 | R42 | " | " | OMIT | | | | | | | |
| 25 | R43 | " | " | OMIT | | | | | | | |
| 26 | R44 | " | " | 100Ω | " | " | " | | 1 | | |
| 27 | R45 | " | " | OMIT | | | | | | | |
| 28 | R46 | " | " | 220K | " | " | " | | 1 | | |
| 29 | | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| 31 | C1 | BOF | CAPACITOR | OMIT | | | | | | | |
| 32 | C2_3 | " | " | 0.1uF | 30V | ERIE | 811T | | 2 | | |

| ISSUE | A | B |
|---|---|---|
| DATE | | 30 8 78 |
| MOD No | ~ | 4926 |

| QTY | — | SHT. 2 OF 3 | DWG. 4 | ML 0832017 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: SYNTHESIZER CB. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. | No. OFF | F 832 | DRAWN REP | CHECKED

SSG 520

| ITEM No | REF No | ORIGIN OF PART | DESCRIPTION | | | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUED |
|---|---|---|---|---|---|---|---|---|---|---|
| 33 | C4 | BOF | CAPACITOR | OMIT | | | | 1 | | |
| 34 | C5 | " | " | 0.1uf | 30V ERIE | 811T | | 1 | | |
| 35 | C6 | " | " | 220uf | 16V MULLARD | 016_15221 | | 1 | | |
| 36 | C7 | " | " | 1500pf | 100V WIMA | FKS 2 MIN | | 1 | | |
| 37 | C8 | " | " | 0.22uf | 63V 10% ADVANCE | CMR 6A | | 1 | | |
| 38 | C9.10 | " | " | 0.047uf | 100V WIMA | FKS 3 | | 2 | | |
| 39 | C11_14 | " | " | 100uf | 25V MULLARD | 016_16101 | | 2 | | |
| 40 | C12_13 | " | " | 0.1uf | 30V ERIE | 811T | | 2 | | |
| 41 | C15 | " | " | 1uf | 63V 10% ADVANCE | ALT. B23119218. MD20A | | 1 | | |
| 42 | C16 | " | " | OMIT | | | | | | |
| 43 | C17 | " | " | OMIT | | | | | | |
| 44 | C18 | " | " | 10kpf | 25V ERIE | 861 | | 1 | | |
| 45 | | | | | | | | | | |
| 46 | | | | | | | | | | |
| 47 | | | | | | | | | | |
| 48 | D1. | BOF | DIODE | OMIT | | | | | | |
| 49 | D2.D3 | " | " | | | E.PAD 100 | | 2 | | |
| 50 | D4 | " | " | | TEXAS | ALT. IN4148. IN914 | | 1 | | |
| 51 | | | * IC MUST NOT BE REMOVED FROM HOLDER EXCEPT WITH INSERTION TOOL | | | | | | | |
| 52 | | | | | | | | | | |
| 53 | | | | | | | | | | |
| 54 | VT1_2 | BOF | TRANSISTOR | | FERRANTI | ZTX313 | | 2 | | |
| 55 | VT3 | " | " | (WITH PAD) | TEXAS | BC182L | | 1 | | |
| 56 | VT4 | " | " | OMIT | | | | | | |
| 57 | | | | | | | | | | |
| 58 | | | | | | | | | | |
| 59 | L1 | BOF | CHOKE | 15uH | | SC10 | | 1 | | |
| 60 | | | | | | | | | | |
| 61 | | | | | | | | | | |
| 62 | | | | | | | | | | |
| 63 | IC1 * | BOF | INTEGRATED CIRCUIT | | RCA | CD4093 | | 1 | | |
| 64 | IC2 * | " | " | " | " | ALT. MC14023. CD4023 | | 1 | | |
| 65 | IC3 * | " | " | " | " | ALT MC14011 CD4011 | | 1 | | |
| 66 | IC4 * | " | " | " | " | ALT 1404 CD4012 | | 1 | | |
| 67 | IC5 * | " | " | " | " | ALT MC14001 CD4001 | | 1 | | |

| ISSUE | A | B | C | D |
|---|---|---|---|---|
| DATE | | 6.4.78 | 21.6.78 | 20.10.78 |
| MOD. No | ~ | 4574 | 4745 | Q 5023 |

| QTY. | SHT. | DWG. | ML |
|---|---|---|---|
| – | 3 OF 3 | 4 | 0832017 |

USED ON: UK832

ASSEMBLY TITLE: SYNTHESIZER CB.

TO BE KIT BY MARSHALLED | KIT MARSHALLED ON

FARNELL INSTRUMENTS LTD. SSG 520 | No. OFF | F 832 | DRAWN PEP | CHECKED

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | | | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUE |
|---|---|---|---|---|---|---|---|---|---|---|
| 68 | IC6_9 | BOF* | INTEGRATED CIRCUIT | | RCA ALT. | MC14017 CD4017 | | 4 | | |
| 69 | IC10 | " * | " | " | SIGNETICS | HEF 4078 (ONLY) | | 1 | | |
| 70 | IC11 | " * | " | " | " | HEF 4013 (ONLY) | | 1 | | |
| 71 | IC12 | " * | " | " | RCA ALT. | MC14011 CD4011 | | 1 | | |
| 72 | IC13 | " * | " | " | " ALT. | MC14029 CD4029 | | 1 | | |
| 73 | IC14_17 | " * | " | " | SIGNETICS | HEF 4029 (ONLY) | | 4 | | |
| 74 | IC18 | " * | " | " | RCA | CA3140 | | 1 | | |
| 75 | | " | IC. SOCKET | 14 WAY | CAMBION | 703_4014_01_04_12 | | 8 | | |
| 76 | | " | " | 16 WAY | " | 703_4016_01_04_12_ | | 9 | | |
| 77 | | | I.C. SOCKET | 8 WAY | " | FOR DIL MATA ONLY 703-4008-01-04-12 | | 1 | | |
| 78 | | | | | | | | | | |
| 79 | | B1. | TRANSISTOR PADS | | | 10218 | | 1 | | |
| 80 | | B1 | " | " | | TW1A | | 2 | | |
| 81 | | | | | | | | | | |
| 82 | | | | | | | | | | |
| 83 | | BOF | TEST POINT | GREEN | CAMBION | 450_4352_01_315 | | 1 | | |
| 84 | | " | " | YELLOW | " | 450_4352_01_314 | | 1 | | |
| 85 | | | | | | | | | | |
| 86 | | | | | | | | | | |
| 87 | | | | | | | | | | |
| 88 | | | NOTE HEF IC. CAN ONLY BE USED WHERE SPECIFIED. | | | | | | | |
| 89 | | | | | | | | | | |
| 90 | * | | IC MUST NOT BE REMOVED FROM HOLDER EXCEPT WITH INSERTION TOOL | | | | | | | |

| ISSUE | 1 | A | B |
|---|---|---|---|
| DATE | 9.12.77 | 21.6.78 | 20.10.78 |
| MOD. No | 4116 | Q9745 | Q5023 |

| QTY. | | SHT. 1 OF 3 | DWG. 4 | ML 0832018 |
|---|---|---|---|---|
| USED ON UK832 | | ASSEMBLY TITLE: 2MHz REF. OSCILLATOR C.B | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSG520 | No. OFF | F 832 | DRAWN J.N | CHECKED

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | | | | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | ISSU |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | BOF | CIRCUIT BOARD MASTER | | | | 2ZZ0832116 | C | 1 | | |
| | | | DRILLING | | | | 2ZZ0832117 | C | REF | | |
| | | | SCREEN | | | | 2ZZ0832118 | C | REF | | |
| | | | SOLDER RESIST SCREEN | | | | 2ZZ0832119 | C | REF | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | R1 | BOF | RESISTOR | 100kΩ | 2% | MULLARD | MR25 | | 1 | | |
| 5 | R2 | " | " | 10MΩ | " | " | CR25 | | 1 | | |
| 6 | R3 | " | " | 10MΩ | " | " | " | | 1 | | |
| 7 | R4 | " | " | 100kΩ | " | " | MR25 | | 1 | | |
| 8 | R5 | " | " | 10kΩ | " | " | " | | 1 | | |
| 9 | R6 | " | " | 100kΩ | " | " | " | | 1 | | |
| 10 | R7 | " | " | 10MΩ | " | " | CR25 | | 1 | | |
| 11 | R8 | " | " | 1kΩ | " | " | MR25 | | 1 | | |
| 12 | R9 | " | " | 4k7 | " | " | " | | 1 | | |
| 13 | R10 | " | " | 4k7 | " | " | " | | 1 | | |
| 14 | R11 | " | " | SOT | | | | | 1 | | |
| 15 | R12 | " | " | SOT | | | | | 1 | | |
| 16 | R13 | " | " | 3k3 | " | " | " | | | | |
| 17 | | | | | | | | | | | |
| 18 | | | | | | | | | | | |
| 19 | C1 | BOF | CAPACITOR | S.O.T. | | | | | 1 | | |
| 20 | C2 | " | " | S.O.T. | | | | | 1 | | |
| 21 | C3 | " | " | S.O.T. | | | | | 1 | | |
| 22 | C4 | " | " | 10KPF | 25V | ERIE | 861 | | 1 | | |
| 23 | C5 | " | " | S.O.T | | | | | | | |
| 24 | C6 | " | " | 10 KPF | 25V | ERIE | 861 | | 1 | | |
| 25 | C7 | " | " | 56 pF | 500V | " | 861 (ALT 831) | | 1 | | |
| 26 | C8 | " | " | 56 pf | 500V | " | 861 (ALT 831) | | 1 | | |
| 27 | C9 | " | " | 10µf | 25V | MULLARD | 015-16109 | | 1 | | |
| 28 | C10 | " | " | SOT | | | | | 1 | | |
| 29 | C11 | " | " | S.O.T. | | | | | 1 | | |
| 31 | C12 | " | " | 1000 pf | 500V | ERIE | 831 | | | | |
| 32 | D1 | BOF | DIODE | | | MOTOROLA | IN4148 | | 1 | | |
| 33 | D2 | " | " | | | " | IN4148 | | 1 | | |

| ISSUE | C | D | E |
|---|---|---|---|
| DATE | 20.7.78 | 10 Jan 79 | 31/3/79 |
| MOD. No | 4805 | 5041 | 05416 |

| QTY. | | SHT. 3 OF 3 | DWG. 4 | ML 0832018 |
|---|---|---|---|---|
| USED ON | UK 832 | ASSEMBLY TITLE: 2MHZ REF. OSCILLATOR C.B. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

| FARNELL INSTRUMENTS LTD. SSG520 | No. OFF | F 832 | DRAWN J.N | CHECKED |
|---|---|---|---|---|

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | PART No. | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|
| | | | TEST AND BUYING INFORMATION ONLY | | | | | |
| | | | THESE COMPONENTS FITTED BY TEST TO CUSTOMERS REQUIREMENTS | | | | | |
| | | | NON OVENED CRYSTAL BOARD | | | | | |
| | C1 | BOF | CAPACITOR 39pf (ALT) LEMCO STABILITY | MR1106 MS139 | | 1 | | |
| | C2 | " | " 10/40pf TRIMMER TRICO | RIGHT ANGLE MTG 10 STR00 21 10/40 N750 | | 1 | | |
| | C3 | " | " 18pf (ALT) LEMCO STABILITY | MS119 MS1106 | | 1 | | |
| | C5 | " | " 24 SWG TC. LINK | | | | | |
| | X1 | | CRYSTAL 2MHz ITT | 4208 | | 1 | | |
| | | | DO NOT FIT LINKS 1.2 & 3. | | | | | |
| | | | OVENED CRYSTAL BOARD OPTION A | | | | | |
| | C1 | BOF | CAPACITOR NOT FITTED | | | | | |
| | C2 | " | " NOT FITTED | | | | | |
| | C3 | " | " NOT FITTED | | | | | |
| | C5 | " | " 0·01µf 160V WIMA | TFM | | 1 | | |
| | C11 | " | " 0·1µf 30V | 81T | | 1 | | |
| | X1 | " | OVENED CRYSTAL SEI | QC1311/1B-3 | | 1 | | |
| | | | DO NOT FIT LINKS 1.2&3 | | | | | |
| | | | OVENED CRYSTAL (VARACTOR TRIMMED) OPTION C. | | | | | |
| | P1 | BOF | MULTI TURN CERMET POT 10K BECKMAN | 89P or 43P | | 1 | | |
| | R11 | " | RESISTOR 47K MULLARD | MR25 | | 1 | | |
| | R12 | " | " 33K MULLARD | " | | 1 | | |
| | C10 | " | CAPACITOR 10Kpf 25V ERIE | 861 | | 1 | | |
| | C11 | " | " 0·1µf 30V | 81T | | 1 | | |
| | X1 | " | OVENED CRYSTAL SEI | QC1311/4J-4. | | 1 | | |
| | | | FIT LINK 1&3 FOR 6 PIN OVEN | | | | | |
| | | | FIT LINK 2 FOR 5 PIN OVEN | | | | | |

| ISSUE | C | D | E |
|---|---|---|---|
| DATE | 20.7.78 | 10 JAN 79 | 2.4.79 |
| MOD. No | 4805 | 5041 | 5420 |

QTY.

USED ON UK832

SHT. 2 OF 3 | DWG 4 | ML 0832018

ASSEMBLY TITLE: 2MHz REF OSCILLATOR C.B

TO BE KIT BY MARSHALLED

KIT MARSHALLED ON

FARNELL INSTRUMENTS LTD.

SSG520

No. OFF

F 832

DRAWN: J.N

CHECKED: (R).

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUED |
|---|---|---|---|---|---|---|---|---|---|
| 34 | D3 | BOF | DIODE | MOTOROLA | 1N4148 | | 1 | | |
| 35 | VT1 | " | TRANSISTOR | TEXAS | BC212L | | 1 | | |
| 36 | Z1 | " | ZENNER DIODE 12V. | ITT | ZF12 | | 1 | | |
| 37 | IC1 | BOF | INTEGRATED CIRCUIT | (ALT) MOTOROLA<br>R.C.A. | MC14069<br>CD4069 | | 1 | | |
| 38 | IC2 | " | " " | (ALT) MOTOROLA<br>RC.A. | MC14023<br>CD4023 | | 1 | | |
| 39 | | | NOTE: HEF IC'S MUST NOT BE USED ON | | | | | | |
| 40 | | | THIS C'B. | | | | | | |
| 41 | | | | | | | | | |
| 42 | P1 | BOF | POTENTIOMETER (CERMET) 10K | | 89P OR 43P | | 1 | | |
| 43 | | | | | | | | | |
| 44 | | BOF | IC SOCKET | CAMBION | 703-4014-01-04-12 | | 2 | | |
| 45 | | B1 | C.B PINS | TUCKER | MR1510D | | 11 | | |
| | | " | TRANSISTOR PAD | | 10218 | | 1 | | |
| | | | NOTE - IC'S MUST NOT BE REMOVED FROM HOLDER EXCEPT WITH INSERTION TOOL. | | | | | | |

| ISSUE | C | D | E |
|---|---|---|---|
| DATE | 20.7.78 | 10 Jan '79 | 31/3/79 |
| MOD. No | 4805 | 5041 | Q5416 |

| QTY. | – | SHT. 1 OF 2 | DWG. 4 | ML 0832019 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: CONTROL C.B. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSG520 | No. OFF | F832 | DRAWN REP | CHECKED

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | PART No. | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|
| 1 | | BOF | CIRCUIT BOARD MASTER | 2220832 120 2 | | 1 | | |
| | | | " " DRILLING | 2220832 121 | | REF | | |
| | | | " " SCREEN | 2220832 122 | | REF | | |
| | | | " " SOLDER RESIST SCREEN | 2220832 123 | | REF | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | R1_11 inc | BOF | RESISTOR 1MΩ 2% MULLARD | CR25 | | 11 | | |
| 5 | R12_24 inc | " | " 100kΩ " " | MR25 | | 13 | | |
| 6 | R25_27 | " | " 10kΩ " " | " | | 3 | | |
| 7 | R28 | " | " 100kΩ " " | " | | 1 | | |
| 8 | R29 | " | OMIT | | | | | |
| 9 | R30 | " | OMIT | | | | | |
| 10 | R31 | " | OMIT | | | | | |
| 11 | R32 | " | OMIT | | | | | |
| 12 | R33 | " | RESISTOR 1MΩ 2% MULLARD | CR25 | | 1 | | |
| 13 | R34 | " | " 100kΩ " " | MR25 | | 1 | | |
| 14 | R35,36 | " | " 10kΩ " " | " | | 2 | | |
| 15 | R37 | " | " 1kΩ " " | " | | 1 | | |
| 16 | R38 | " | " 33kΩ " " | " | | 1 | | |
| 17 | R39 | " | " 10kΩ " " | " | | 1 | | |
| 18 | R40 | " | " 8k2Ω " " | " | | 1 | | |
| 19 | R41 | " | " 1kΩ " " | " | | 1 | | |
| 20 | R42 | " | " 6k8Ω " " | " | | 1 | | |
| 21 | R43 | " | " 3k3Ω " " | " | | 1 | | |
| 22 | R44,45 | " | " 22kΩ " " | " | | 2 | | |
| 23 | R46 | " | " 47kΩ " " | " | | 1 | | |
| 24 | R47 | " | " 6k8Ω " " | " | | 1 | | |
| 25 | R48 | " | " 10kΩ " " | " | | 1 | | |
| 26 | R49 | " | " 3k9Ω " " | " | | 1 | | |
| 27 | R50 | " | " 47kΩ " " | " | | 1 | | |
| 28 | R51 | " | " 56kΩ " " | " | | 1 | | |
| 29 | R52 | " | " 6k8Ω " " | " | | 2 | | |
| 30 | R53 | " | " 8k2Ω " " | " | | 1 | | |
| 31 | R54 | " | " 180kΩ " " | " | | 1 | | |
| 32 | | | | | | | | |

| ISSUE | 1 |
|---|---|
| DATE | 9.12.77 |
| MOD. No | 1176 |

| QTY. | — | SHT. 2 OF 2 | DWG. 4 | ML 0832019 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: CONTROL CB. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSG 520. | No. OFF | F 832 | DRAWN PEP | CHECKED

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | | | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSU |
|---|---|---|---|---|---|---|---|---|---|---|
| 32 | C1_2 | BOF | CAPACITOR | 470pf 500V | ERIE | 831 | | 2 | | |
| 34 | | | | | | | | | | |
| 35 | | | | | | | | | | |
| 36 | | | | | | | | | | |
| 37 | D1_61 | BOF | DIODE | | TEXAS | IN4148 | | 57 | | |
| 38 | | | | | | | | | | |
| 39 | | | | | | | | | | |
| 40 | | | | | | | | | | |
| 41 | VT1. | BOF | TRANSISTOR (WITH PAD) | | TEXAS | BC182L | | 1 | | |
| 42 | | | | | | | | | | |
| 43 | | | | | | | | | | |
| 44 | | | | | | | | | | |
| 45 | P1 | BOF | POTENTIOMETER | 10kΩ | BECKMAN | 72P | | 1 | | |
| 46 | P2 | " | " | 5kΩ | " | " | | 1 | | |
| 47 | P3 | " | " | 2kΩ | " | " | | 1 | | |
| 48 | P4 | " | " | 25kΩ | " | " | | 1 | | |
| 49 | | | | | | | | | | |
| 50 | SW1 | BOF | SWITCH | | ERG | SDCS | | 1 | | |
| 51 | | | | | | | | | | |
| 52 | IC1_2 | BOF * | INTEGRATED CIRCUIT | | RCA ALT. | MC14028 CD4028 | | 2 | | |
| 53 | IC3 | " * | " | " | " ALT. | MC14042 CD4042 | | 1 | | |
| 54 | IC4 | " * | " | " | " ALT | MC14029 CD4029 | | 1 | | |
| 55 | IC5 | " * | " | " | " ALT | MC14069 CD4069 | | 1 | | |
| 56 | IC6 | " * | " | " | " ALT | CD14002 CD4002 | | 1 | | |
| 57 | IC7_9 | " * | " | " | MOTOROLA. | MC14585 | | 3 | | |
| 58 | IC10 | " * | " | " | RCA CA741CE MOTOROLA | MA741 (DIL) | | 1 | | |
| 59 | | " | I.C. SOCKET | 8 WAY | CAMBION | FOR DIL MA741 ONLY. 703_4008_01_04_12 | | 1 | | |
| 60 | | " | " | " 14 WAY | " | 703_4014_01_04_12 | | 2 | | |
| 61 | | " | " | " 16 WAY | " | 703_4016_01_04_12 | | 7 | | |
| 62 | | BI | TRANSISTOR PAD | | | 10218 | | 1 | | |
| 63 | | | | | | | | | | |
| 64 | | | | | | | | | | |
| 65 | | NOTE | HEF ICs MUST NOT BE USED ON THIS C'B. | | | | | | | |
| 66 | * | | ICs MUST NOT BE REMOVED FROM HOLDERS EXCEPT WITH INSERTION TOOL | | | | | | | |
| 67 | | | | | | | | | | |

| ISSUE | 1 | B | C |
|---|---|---|---|
| DATE | 9.12.77 | 10 + 18 | 21.6.78 |
| MOD. No | 4456 | 4621 | 04745 |

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|---|---|---|---|---|---|
| SHT 1 OF 7 | DWG. 4 | ML 0832020 | | | |
| ASSEMBLY TITLE: AUDIO CIRCUIT BOARD | | | | | |
| TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | | | | |
| FARNELL INSTRUMENTS LTD. SSG520 | No OFF | F 832 | DRAWN JC | CHECKED | |

| ITEM No. | REF No. | ORIGIN OF PART | DESCRIPTION | PART No | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUE |
|---|---|---|---|---|---|---|---|---|
| 1 | | BOF | CIRCUIT BOARD MASTER | 2220832124 2 | | 1 | | |
| | | | " " DRILLING | 2220832125 | | REF | | |
| | | | " " SCREEN | 2220832126 | | REF | | |
| | | | " " SOLDER RESIST SCREEN | 2220832127 | | REF | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | R1 | BOF | RESISTOR 20KΩ 2% MULLARD | MR25 | | 1 | | |
| 5 | R2 | " | " 2K7Ω " " | " | | 1 | | |
| 6 | R3 | " | " 1MΩ " " | CR25 | | 1 | | |
| 7 | R4 | " | " 1MΩ " " | " | | 1 | | |
| 8 | R5 | " | " 15KΩ " " | MR25 | | 1 | | |
| 9 | R6 | " | " 150Ω " " | " | | 1 | | |
| 10 | R7 | " | " 2KΩ " " | MR30 | | 1 | | |
| 11 | R8 | " | " 1MΩ " " | CR25 | | 1 | | |
| 12 | R9 | " | " 100KΩ " " | MR25 | | 1 | | |
| 13 | R10 | " | " 11KΩ " " | " | | 1 | | |
| 14 | R11 | " | " 1KΩ " " | " | | 1 | | |
| 15 | R12 | " | " 3KΩ " " | " | | 1 | | |
| 16 | R13 | " | " 1KΩ " " | " | | 1 | | |
| 17 | R14 | " | " 100KΩ " " | " | | 1 | | |
| 18 | R15 | " | " 1MΩ " " | CR25 | | 1 | | |
| 19 | R16 | " | " 20KΩ " " | MR25 | | 1 | | |
| 20 | R17 | " | " 1MΩ " " | CR25 | | 1 | | |
| 21 | R18 | " | " 2KΩ " " | MR30 | | 1 | | |
| 22 | R19 | " | " 2K7Ω " " | MR25 | | 1 | | |
| 23 | R20 | " | " 100KΩ " " | " | | 1 | | |
| 24 | R21 | " | " 1MΩ " " | CR25 | | 1 | | |
| 25 | R22 | " | " 1MΩ " " | " | | 1 | | |
| 26 | R23 | " | " 1KΩ " " | MR25 | | 1 | | |
| 27 | R24 | " | " 1MΩ " " | CR25 | | 1 | | |
| 28 | R25 | " | " 100KΩ " " | MR25 | | 1 | | |
| 29 | R26 | " | " 10KΩ " " | " | | 1 | | |
| 30 | R27 | " | " 560Ω " " | " | | 1 | | |
| 31 | R28 | " | " 10KΩ " " | " | | 1 | | |
| 32 | R29 | " | " 3K3Ω " " | " | | 1 | | |

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| ISSUE | 1 |
| DATE | 9-12-77 |
| MOD No | 4456 |

| QTY | | SHT 2 OF 7 | DWG. 4 | ML 0832020 |
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| USED ON | | ASSEMBLY TITLE: AUDIO CIRCUIT BOARD | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

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| SSG520 | | 832 | JC | [illegible] |

| ITEM No. | REF No. | ORIGIN OF PART | DESCRIPTION | PART No. | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|
| 33 | R30 | BOF | RESISTOR 100Ω 2% MULLARD | MR25 | | 1 | | |
| 34 | R31 | " | " 1MΩ " " | CR25 | | 1 | | |
| 35 | R32 | " | " 100KΩ " " | MR25 | | 1 | | |
| 36 | R33 | " | " 56KΩ " " | " | | 1 | | |
| 37 | R34 | " | " 2K7Ω " " | " | | 1 | | |
| 38 | R35 | " | " 270KΩ " " | " | | 1 | | |
| 39 | R36 | " | " 28K7Ω 1% ALT HOLDSWORTH RESOLUTE | H8 50PPM RC55 50PPM | | 1 | | |
| 40 | R37 | " | " 28K7Ω " " | " | | 1 | | |
| 41 | R38 | " | " ALT 12K4Ω 12K5Ω 2% 1% MULLARD RESOLUTE | MR25 RC55 50PPM | | 1 | | |
| 42 | R39 | " | " 28K7Ω " ALT HOLDSWORTH " | H8 50PPM RC55 50PPM. | | 1 | | |
| 43 | R40 | " | " 100KΩ 2% MULLARD | MR25 | | 1 | | |
| 44 | R41 | " | " 100KΩ " " | " | | 1 | | |
| 45 | R42 | " | " 1MΩ " " | CR25 | | 1 | | |
| 46 | R43 | " | " 2M2Ω " " | " | | 1 | | |
| 47 | R44 | " | " 2M2Ω " " | " | | 1 | | |
| 48 | R45 | " | " 18KΩ " " | MR25 | | 1 | | |
| 49 | R46 | " | " 15KΩ " " | " | | 1 | | |
| 50 | R47 | " | " 15KΩ " " | " | | 1 | | |
| 51 | R48 | " | " 150KΩ " " | " | | 1 | | |
| 52 | R49 | " | " 4M7Ω " " | CR25 | | 1 | | |
| 53 | R50 | " | " 1KΩ " " | MR25 | | 1 | | |
| 54 | R51 | " | " 18KΩ " " | " | | 1 | | |
| 55 | R52 | " | " 15KΩ " " | " | | 1 | | |
| 56 | R53 | " | " 15KΩ " " | " | | 1 | | |
| 57 | R54 | " | " 150KΩ " " | " | | 1 | | |
| 58 | R55 | " | " 1MΩ " " | CR25 | | 1 | | |
| 59 | R56 | " | " 2K2Ω " " | MR25 | | 1 | | |
| 60 | R57 | " | " 10KΩ " " | " | | 1 | | |
| 61 | R58 | " | " 10KΩ " " | " | | 1 | | |
| 62 | R59 | " | " 28K7Ω 1% ALT HOLDSWORTH RESOLUTE | H8. 50PPM RC55 50PPM | | 1 | | |
| 63 | R60 | " | " 28K7Ω " " | " | | 1 | | |
| 64 | R61 | " | " OMITTED. | | | 1 | | |
| 65 | R62 | " | " " | | | 1 | | |
| 66 | R63 | " | " 10MΩ 2% MULLARD | CR25 | | 1 | | |
| 67 | R64 | " | " 560Ω " " | MR25 | | 1 | | |

| ISSUE | 1 |
|---|---|
| DATE | 9-12-77 |
| MOD. No | 4456 |

QTY.

USED ON

SHT 3 OF 7 | DWG. 4 | ML 0832020

ASSEMBLY TITLE: AUDIO CIRCUIT BOARD

TO BE KIT BY MARSHALLED

KIT MARSHALLED ON

FARNELL INSTRUMENTS LTD.

SSG520

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| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | PART No | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUED |
|---|---|---|---|---|---|---|---|---|
| 68 | R65 | BOF | RESISTOR 18KΩ 2% MULLARD | MR25 | | 1 | | |
| 69 | R66 | " | " 18KΩ " " | " | | 1 | | |
| 70 | R67 | | OMITTED | | | 1 | | |
| 71 | R68 | " | " 10KΩ " " | " | | 1 | | |
| 72 | R69 | " | " 100KΩ " " | " | | 1 | | |
| 73 | R70 | " | " 100KΩ " " | " | | 1 | | |
| 74 | R71 | " | " 100KΩ " " | " | | 1 | | |
| 75 | R72 | " | " 100KΩ " " | " | | 1 | | |
| 76 | R73 | " | " 10KΩ " " | " | | 1 | | |
| 77 | R74 | " | " 100KΩ " " | " | | 1 | | |
| 78 | R75 | " | " 100KΩ " " | " | | 1 | | |
| 79 | R76 | " | " 1KΩ " " | " | | 1 | | |
| 80 | R77 | " | " 560KΩ " " | MR30 | | 1 | | |
| 81 | R78 | " | " 150KΩ " " | MR25 | | 1 | | |
| 82 | R79 | " | " 10KΩ " " | " | | 1 | | |
| 83 | R80 | " | " 10KΩ " " | " | | 1 | | |
| 84 | R81 | " | " 150KΩ " " | " | | 1 | | |
| 85 | R82 | " | " 150KΩ " " | " | | 1 | | |
| 86 | R83 | " | " 560KΩ " " | MR30 | | 1 | | |
| 87 | R84 | " | " 150KΩ " " | MR25 | | 1 | | |
| 88 | R85 | " | " 100KΩ " " | " | | 1 | | |
| 89 | R86 | " | " 100KΩ " " | " | | 1 | | |
| 90 | R87 | | LINK | | | 1 | | |
| 91 | R88 | " | " 15KΩ " " | " | | 1 | | |
| 92 | R89 | " | " 15KΩ " " | " | | 1 | | |
| 93 | R90 | " | " 150KΩ " " | " | | 1 | | |
| 94 | R91 | " | " 18KΩ " " | " | | 1 | | |
| 95 | R92 | " | " 1MΩ " " | CR25 | | 1 | | |
| 96 | R93 | " | " 2K2Ω " " | MR25 | | 1 | | |
| 99 | R94 | " | " 8.2KΩ " " | " | | 1 | | |
| 100 | R95 | " | " 18KΩ " " | " | | 1 | | |
| 101 | R96 | " | " 18KΩ " " | " | | 1 | | |
| 102 | R97 | " | " 100KΩ " " | " | | 1 | | |
| 103 | R98 | " | " 100KΩ " " | " | | 1 | | |
| 104 | | | | | | | | |

| ISSUE | A | B |
|---|---|---|
| DATE | | 30 Aug 78 |
| MOD No | | 4924 |

| QTY | | SHT 4 OF 7 | DWG 4 | ML 0832020 |
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| ISSUED FOR | | ASSEMBLY TITLE: AUDIO CIRCUIT BOARD | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

| FARNELL INSTRUMENTS LTD | No. OFF | | DRAWN | CHECKED |
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| SSG520 | | 832 | SC | |

| ITEM No. | REF No. | SUBSTITUTION OF PART | DESCRIPTION | | | | PART No | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUED |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 105 | C1 | BOF | CAPACITOR | 0·1MF | 160V | WIMA | TFM | | 1 | | |
| 106 | C2 | " | " | 47PF | | ERIE | 801 | | 1 | | |
| 107 | C3 | " | " | 0·1MF | 30V | " | 811T | | 1 | | |
| 108 | C4 | " | " | 0·1MF | 160V | WIMA | TFM | | 1 | | |
| 109 | C5 | " | " | 100MF | 10V | MULLARD | 016-14101 | | 1 | | |
| 110 | C6 | " | " | 0·1MF | 160V | WIMA | TFM | | 1 | | |
| 110 | C7 | " | " | 0·1MF | " | " | " | | 1 | | |
| 111 | C8 | " | " | 47PF | | ERIE | 801 | | 1 | | |
| 112 | C9 | " | " | 0·1MF | 160V | WIMA | TFM | | 1 | | |
| 113 | C10 | " | " | 0·1MF | 30V | ERIE | 811T | | 1 | | |
| 114 | C11 | " | " | 47PF | | " | 801 | | 1 | | |
| 115 | C12 | " | " | 0·1MF | 160V | WIMA | TFM | | 1 | | |
| 116 | C13 | " | " | 0·1MF | " | " | " | | 1 | | |
| 117 | C14 | " | " | 47PF | | ERIE | 801 | | 1 | | |
| 118 | C15 | " | " | 0·1MF | 160V | WIMA | TFM | | 1 | | |
| 119 | C16 | " | " | 0·1MF | 30V | ERIE | 811T | | 1 | | |
| 120 | C17 | " | " | 47PF | | " | 801 | | 1 | | |
| 121 | C18 | " | " | 5600PF | | MATHEY | A15E | | 1 | | |
| 122 | C19 | " | " | 5600PF | | " | " | | 1 | | |
| 123 | C20 | " | " | 0·47MF | ALT 63V | ASHCROFT ADVANCE | A2847111A MD10A | | 1 | | |
| 124 | C21 | " | " | 0·47MF | " | " | " | | 1 | | |
| 125 | C22 | " | " | 5·6PF | | ERIE | 861 | | 1 | | |
| 126 | C23 | " | " | 47PF | | " | 801 | | 1 | | |
| 127 | C24 | " | " | 0·1MF | 30V | " | 811T | | 1 | | |
| 128 | C25 | " | " | 10MF | 25V | MULLARD | 015-16109 | | 1 | | |
| 129 | C26 | " | " | 0·1MF | 30V | ERIE | 811T | | 1 | | |
| 130 | C27 | " | " | 150PF | | " | 831 | | 1 | | |
| 131 | C28 | " | " | 0·1MF | 160V | WIMA | TFM | | 1 | | |
| 132 | C29 | " | " | 150PF | | ERIE | 831 | | 1 | | |
| 133 | C30 | " | " | 150PF | | " | " | | 1 | | |
| 134 | C31 | " | " | 0·1MF | 160V | WIMA | TFM | | 1 | | |
| 135 | C32 | " | " | 150PF | | ERIE | 831 | | 1 | | |
| 136 | C33 | " | " | 220MF | 16V | MULLARD | 016-15221 | | 1 | | |
| 137 | C34 | " | " | 0·1MF | 30V | WIMA | 811T | | 1 | | |
| 138 | C35 | " | " | 5600PF | | MATHEY | A15E | | 1 | | |

| ISSUE | 1 |
|---|---|
| DATE | 9-12-78 |
| MOD No | 4456 |

| QTY. | | SHT 5 OF 7 | DWG. 4 | ML 0832020 |
|---|---|---|---|---|
| USED ON | | ASSEMBLY TITLE: AUDIO CIRCUIT BOARD | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

| FARNELL INSTRUMENTS LTD. | No. OFF | F | DRAWN | CHECKED |
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| SSG 520 | | 832 | JC | [signature] |

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | PART No | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|
| 139 | C36 | BOF | CAPACITOR 5600PF MATHEY | A15E | | 1 | | |
| 140 | C37 | " | " 0·1μF 30V WIMA | 811T | | 1 | | |
| 141 | C38 | " | NOT FITTED | | | 1 | | |
| 142 | C39 | " | " 0·022μF 160V WIMA | TFM | | 1 | | |
| 143 | C40 | " | " 0·022μF " " | " | | 1 | | |
| 144 | C41 | " | " 150PF ERIE | 831 | | 1 | | |
| 145 | C42 | " | " 0·47μF 63V ADVANCE (ALT ASHCROFT A2B4711A) | MD10A | | 1 | | |
| 146 | C43 | " | NOT FITTED | | | 1 | | |
| 147 | C44 | " | NOT FITTED | | | 1 | | |
| 148 | C45 | " | NOT FITTED | | | 1 | | |
| 149 | C46 | " | " 1μF 63V ADVANCE (ALT ASHCROFT A2B1021B) | MD20A | | 1 | | |
| 150 | C47 | " | " 150PF ERIE | 831 | | 1 | | |
| 151 | C48 | " | " 0·1μF 160V WIMA | TFM | | 1 | | |
| 152 | C49 | " | " 150PF ERIE | 831 | | 1 | | |
| 153 | C50 | " | " 220μF 16V MULLARD | 016-15221 | | 1 | | |
| 154 | C51 | " | " 1μF 63V ADVANCE (ALT ASHCROFT A2B1021B) | MD20A | | 1 | | |
| 155 | | | | | | | | |
| 156 | | | | | | | | |
| 157 | | | | | | | | |
| 158 | P1 | BOF | POTENTIOMETER 10KΩ SPECTROL RELIANCE | 47P | | 1 | | |
| 159 | P2 | " | " 5KΩ " | " | | 1 | | |
| 160 | P3 | " | " OMIT | | | 1 | | |
| 161 | P4 | " | " OMIT | | | 1 | | |
| 162 | P5 | " | " 500Ω BECKMAN | 72P | | 1 | | |
| 163 | P6 | " | " 1KΩ " | " | | 1 | | |
| 164 | P7 | " | " 10KΩ " | " | | 1 | | |
| 165 | P8 | " | " 1KΩ " | " | | 1 | | |
| 166 | | | | | | | | |
| 167 | | | | | | | | |
| 168 | | | | | | | | |
| 169 | D1 | BOF | DIODE TEXAS | 1N4148 | | 1 | | |
| 170 | D2 | " | " " | " | | 1 | | |
| 171 | D3 | " | " " | " | | 1 | | |
| 172 | D4 | " | " " | " | | 1 | | |
| 173 | D5 | " | " " | " | | 1 | | |

| ISSUE | A | B | C |
|---|---|---|---|
| DATE | | 10-4-78 | 10-4-78 |
| MOD. No | ~ | 4574 | 4621 |

QTY. | USED ON | SHT 6 OF 7 | DWG. 4 | ML 0832020

ASSEMBLY TITLE: AUDIO CIRCUIT BOARD

TO BE KIT BY MARSHALLED | KIT MARSHALLED ON

FARNELL INSTRUMENTS LTD. | No OFF | F 832 | DRAWN SC | CHECKED

SSG520

| ITEM No | REF. No. | ORIGIN OF PART | DESCRIPTION | | PART No | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUE |
|---|---|---|---|---|---|---|---|---|---|
| 174 | D6 | BOF | DIODE | TEXAS | IN4148 | | 1 | | |
| 175 | D7 | " | " | " | " | | 1 | | |
| 176 | D8 | " | " | " | " | | 1 | | |
| 177 | D9 | " | " | " | " | | 1 | | |
| 178 | D10 | " | " | " | " | | 1 | | |
| 179 | D11 | " | " | " | " | | 1 | | |
| 180 | | | | | | | | | |
| 181 | | | | | | | | | |
| 182 | | | | | | | | | |
| 183 | | | | | | | | | |
| 184 | VT1 | BOF | TRANSISTOR | SILICONIX | VCR3P | | 1 | | |
| 185 | VT2 | " | " | " | " | | 1 | | |
| 186 | VT3 | " | " WITH PAD | TEXAS | BC212L | | 1 | | |
| 187 | VT4 | " | " " " | " | BC182L | | 1 | | |
| 188 | VT5 | " | " " " | " | " | | 1 | | |
| 189 | VT6 | " | " " " | " | " | | 1 | | |
| 190 | | | | | | | | | |
| 191 | | BOF | THERMISTOR NUT | | | | 1 | | |
| 192 | | " | " CLAMP | | A1051 | | 1 | | |
| 193 | | " | " | | R54 | | 1 | | |
| 194 | RL1 | " | RELAY | OSMOR | LPD24 | | 1 | | |
| 195 | RL2 | " | " | " | " | | 1 | | |
| 196 | | | | | | | | | |
| 197 | * IC'S MUST NOT BE REMOVED FROM HOLDER EXCEPT WITH INSERTION TOO | | | | | | | | |
| 198 | | | | | | | | | |
| 199 | IC1 | BOF | INTEGRATED CIRCUIT | RCA | CA3130E | | 1 | | |
| 200 | IC2 | " | " | " | " | | 1 | | |
| 201 | IC3 | " | " | " | " | | 1 | | |
| 202 | IC4 | " | " | " | " | | 1 | | |
| 203 | IC5 | " | " | " | " | | 1 | | |
| 204 | IC6 | " | " | " | " | | 1 | | |
| 205 | IC7 | " | " | " | CA741CG | | 1 | | |
| 206 | IC8 | " | " | " | CA3130E | | 1 | | |
| 207 | IC9 | " | " | " | " | | 1 | | |
| 208 | IC10 | " | " | " | " | | 1 | | |

| ISSUE | A | B | C | D |
|---|---|---|---|---|
| DATE | | 10-4-78 | 10-4-78 | 21-6-78 |
| MOD No | ~ | 4456 | 4621 | 4745 |

| | | | | | |
|---|---|---|---|---|---|
| SHT. 7 OF 7 | DWG. 4 | ML 0832020 | | | |
| ASSEMBLY TITLE: AUDIO CIRCUIT BOARD | | | | | |
| TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | | | | |
| FARNELL INSTRUMENTS LTD. SSG520 | No. OFF | F 832 | DRAWN JC | CHECKED M. | |

| ITEM No. | REF No. | ORIGIN OF PART | DESCRIPTION | | PART No | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|---|
| 209 | IC11 | BOF | INTEGRATED CIRCUIT | RCA | CA3130E | | 1 | | |
| 210 | IC12 | " | " " | " | " | | 1 | | |
| 211 | IC13 | " | " " | FAIRCHILD | UAF356TC | | 1 | | |
| 212 | IC14 | " | " " | " | " | | 1 | | |
| 213 | IC15 | " | " " | " | " | | 1 | | |
| 214 | IC16 | " | " " | RCA | CA3130E | | 1 | | |
| 215 | IC17 | " | " " | " | " | | 1 | | |
| 216 | IC18 | " | " " | FAIRCHILD | UAF356TC | | 1 | | |
| 217 | | " | IC. SOCKET | CAMBION | 703-4008-01-04-12 | | 18 | | |
| 218 | | | FITTED WITH DUAL-IN-LINE IC'S ONLY. | | | | | | |
| 219 | | | | | | | | | |
| 220 | | BOF | TEST POINT YELLOW | CAMBION | 450-4352-01-314 | | 1 | | |
| 221 | | " | " " GREEN | " | " " " 315 | | 1 | | |
| 222 | | " | " " BLUE | " | " " " 316 | | 1 | | |
| 223 | | " | " " WHITE | " | " " " 319 | | 1 | | |
| 224 | | " | " " BLACK | " | " " " 310 | | 1 | | |
| 225 | | | | | | | | | |
| 226 | | | | | | | | | |
| 227 | | | | | | | | | |
| 228 | | B1 | TRANSISTOR PAD | | 10218 | | 4 | | |
| 229 | | " | " " | | TWA | | 2 | | |
| 230 | | | | | | | | | |
| 231 | | | | | | | | | |
| 232 | | | | | | | | | |
| 233 | | | | | | | | | |
| 234 | | | | | | | | | |
| 235 | | | | | | | | | |
| 236 | | | | | | | | | |
| 237 | | | | | | | | | |
| 238 | | | | | | | | | |
| 239 | | | | | | | | | |
| 240 | | | | | | | | | |
| 241 | | | | | | | | | |
| 242 | * IC'S MUST NOT BE REMOVED FROM HOLDER EXCEPT WITH INSERTION TOOL. | | | | | | | | |
| 243 | | | | | | | | | |

| | | | |
|---|---|---|---|
| ISSUE | A | B | C |
| DATE | 12-4-78 | 20-6-78 | |
| MOD. No. | 44564745 | | |

| QTY. | — | SHT. 1 OF 4 | DWG. 4 | ML 0832021 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: FM. CORRECTION CB. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSG520. | No. OFF | F 832 | DRAWN PEP | CHECKED

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUE |
|---|---|---|---|---|---|---|---|---|
| 1 | | BOF | CIRCUIT BOARD MASTER | 2ZZ0832128½ | | 1 | | |
| | | | " " DRILLING | 2ZZ0832129 | | REF | | |
| | | | " " SCREEN | 2ZZ0832130 | | REF | | |
| | | | " " SOLDER RESIST SCREEN | 2ZZ0832131 | | REF | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | R1 | BOF | RESISTOR 5kΩ 2% MULLARD | MR25 | | 1 | | |
| 5 | R2 | " | " 22kΩ " " | " | | 1 | | |
| 6 | R3 | " | " 10kΩ " " | " | | 1 | | |
| 7 | R4 | " | " 15kΩ " " | " | | 1 | | |
| 8 | R5 | " | " 50kΩ " " | " | | 1 | | |
| 9 | R6 | " | " 50kΩ " " | " | | 1 | | |
| 10 | R7 | " | " 50kΩ " " | " | | 1 | | |
| 11 | R8 | " | " 50kΩ " " | " | | 1 | | |
| 12 | R9 | " | " 50kΩ " " | " | | 1 | | |
| 13 | R10 | " | " 50kΩ " " | " | | 1 | | |
| 14 | R11 | " | " 50kΩ " " | " | | 1 | | |
| 15 | R12 | " | " 50kΩ " " | " | | 1 | | |
| 16 | R13 | " | " 25kΩ " " | " | | 1 | | |
| 17 | R14 | " | " 25kΩ " " | " | | 1 | | |
| 18 | R15 | " | " 25kΩ " " | " | | 1 | | |
| 19 | R16 | " | " 25kΩ " " | " | | 1 | | |
| 20 | R17 | " | " 25kΩ " " | " | | 1 | | |
| 21 | R18 | " | " 25kΩ " " | " | | 1 | | |
| 22 | R19 | " | " 180kΩ " " | " | | 1 | | |
| 23 | R20 | " | " 10kΩ " " | " | | 1 | | |
| 24 | R21 | " | " 10kΩ " " | " | | 1 | | |
| 25 | R22 | " | " 25kΩ " " | " | | 1 | | |
| 26 | R23 | " | " 2k4Ω " " | " | | 1 | | |
| 27 | R24 | " | " 10kΩ " " | " | | 1 | | |
| 28 | R25 | " | " 20kΩ " " | " | | 1 | | |
| 29 | R26 | " | " 10kΩ " " | " | | 1 | | |
| 30 | | | | | | | | |
| 31 | | | | | | | | |
| 32 | | | | | | | | |

| ISSUE | A | B | C |
|---|---|---|---|
| DATE | | 10-4-78 | 11 JAN '79 |
| MOD No | ~ | 4021 | 5243 |

| QTY | – | SHT. 2 OF 4 | DWG. 4 | ML 0832021 |
|---|---|---|---|---|
| USED ON | UKB32 | ASSEMBLY TITLE: FM. CORRECTION CB. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSG520 | No. OFF | F 832 | DRAWN REP | CHECKED

| ITEM No. | REF No. | ORIGIN OF PART | DESCRIPTION | | | PART No. | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|---|---|
| 33 | | | | | | | | 1 | | |
| 34 | | | | | | | | 1 | | |
| 35 | R32 | " | RESISTOR | 2M2Ω | " MULLARD | CR25 | | 1 | | |
| 36 | | | | | | | | 1 | | |
| 37 | R34 | " | RESISTOR | 100kΩ | 2% MULLARD | MR25 | | 1 | | |
| 38 | R35 | " | " | 100kΩ | " " | " | | 1 | | |
| 39 | R36 | " | " | 100kΩ | " " | " | | 1 | | |
| 40 | R37 | " | " | 100kΩ | " " | " | | 1 | | |
| 41 | R38 | " | " | 220kΩ | " " | " | | 1 | | |
| 42 | R39 | " | " | 100Ω | " " | " | | 1 | | |
| 43 | R40 | " | " | 1kΩ | " " | " | | 1 | | |
| 44 | R41 | " | " | 10kΩ | " " | " | | 1 | | |
| 45 | R42 | " | " | 10kΩ | " " | " | | 1 | | |
| 46 | R43 | " | " | 220kΩ | " " | " | | 1 | | |
| 47 | R44 | " | " | 47kΩ | " " | " | | 1 | | |
| 48 | R45 | " | NOT USED | | | | | | | |
| 49 | R46 | " | " | | | | | | | |
| 50 | R47 | " | RESISTOR | 3M3Ω | " " | CR25 | | 1 | | |
| 51 | R48 | " | " | 10kΩ | " " | MR25 | | 1 | | |
| 52 | R49 | " | " | 100kΩ | " " | " | | 1 | | |
| 53 | R50 | " | " | 100kΩ | " " | " | | 1 | | |
| 54 | R51 | " | " | 100kΩ | " " | " | | 1 | | |
| 55 | R52 | " | " | 100kΩ | " " | " | | 1 | | |
| 56 | R53 | " | " | 100kΩ | " " | " | | 1 | | |
| 57 | R54 | " | " | 10kΩ | " " | " | | 1 | | |
| 58 | R55 | " | " | 100Ω | " " | " | | 1 | | |
| 59 | R56 | " | " | 6·8k | " " | " | | 1 | | |
| 60 | R57 | " | " | 1MΩ | " " | CR25 | | 1 | | |
| 61 | R58 | " | " | 100kΩ | " " | MR25 | | 1 | | |
| 62 | R59 | " | " | 100kΩ | " " | " | | 1 | | |
| 63 | C1 | BOF | CAPACITOR | 22uf 16V | ITT | TAG 22/16 | | 1 | | |
| 64 | C2 | " | " | 0.01uF | WIMA | TFM | | 1 | | |
| 65 | C3 | " | " | 22pF | " | YD. | | 1 | | |
| 66 | C4 | " | " | 0.1uf 30V | ERIE | 811T | | 1 | | |
| 67 | C5 | " | " | 0.1uf 30V | " | " | | 1 | | |

| ISSUE | A | B. | C | D | E |
|---|---|---|---|---|---|
| DATE | | 6.4.78 | 10-4-78 | 18 4 78 | 11 JAN'79 |
| MOD No. | | CS. 4574 | 4621 | 4646 | 5243 |

QTY. –

USED ON UK832

SHT. 3 OF 4 | DWG. 4 | ML 0832021

ASSEMBLY TITLE: FM. CORRECTION CB.

TO BE KIT BY MARSHALLED | KIT MARSHALLED ON

FARNELL INSTRUMENTS LTD. SSG520 | No. OFF | F 832 | DRAWN PRP | CHECKED

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | | PART No. | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|---|
| 68 | C6 | BOF | CAPACITOR 47PF | ERIE | YD. | | 1 | | |
| 69 | C7 | " | " NOT FITTED | | | | | | |
| 70 | C8 | " | " 10kPF | ERIE | 861 | | 1 | | |
| 71 | C9 | " | " 10kPF | " | " | | 1 | | |
| 72 | C10 | " | " NOT FITTED | | | | | | |
| 73 | C11 | " | " 1uF 63V | ADVANCE | CTR20D | | 1 | | |
| 74 | C12 | " | " 1uF 63V | " | " | | 1 | | |
| 75 | C13 | " | " 0.047uF 100V | WIMA | FKS3 | | 1 | | |
| 76 | C14 | " | " 0.1uF 30V | ERIE | 811T | | 1 | | |
| 77 | C15 | " | " 0.1uF 30V | " | " | | 1 | | |
| 78 | C16 | " | " 0.047uF 100V | WIMA | FKS3 | | 1 | | |
| 79 | C17 | " | " 0.1uF 160V | " | MKC4 | | 1 | | |
| 80 | C18 | " | " 0.1uF 160V | " | " | | 1 | | |
| 81 | C19 | " | " 10uF 25V | MULLARD | 015_16109 | | 1 | | |
| 82 | C20 | " | " 10uF 25V | " | " | | 1 | | |
| 83 | C21 | " | " 0.47uF | ADVANCE | MD10A | | 1 | | |
| 84 | C22 | " | " 10kPF | ERIE | 861 | | 1 | | |
| 85 | C23 | " | " 10kPF | " | " | | 1 | | |
| 86 | | | | | | | | | |
| 87 | | | | | | | | | |
| 88 | | | | | | | | | |
| 89 | | | | | | | | | |
| 90 | D1_10 | BOF | DIODE | TEXAS | IN4148 | | 10 | | |
| 91 | | | | | | | | | |
| 92 | | | | | | | | | |
| 93 | | | | | | | | | |
| 94 | *IC'S MUST NOT BE REMOVED FROM HOLDER EXCEPT WITH INSERTION TOOL | | | | | | | | |
| 95 | IC1* | BOF | INTEGRATED CIRCUIT | ALT. | MC14016 CD4016 | | 1 | | |
| 96 | IC2* | " | " | " | CA3140E(DIL) | | 1 | | |
| 97 | IC3* | " | " | ALT | MC14016 CD4016 | | 1 | | |
| 98 | IC4* | " | " | ALT. | MC14016 CD4016 | | 1 | | |
| 99 | IC5* | " | " | ALT | MC14016 CD4016 | | 1 | | |
| 100 | IC6* | " | " | ALT | MC14016 CD4016 | | 1 | | |
| 101 | IC7* | " | " | ALT | MC14066 CD4066 | | 1 | | |
| 102 | IC8* | " | " | ALT. | MC14066 CD4066 | | 1 | | |

| ISSUE | A | B | C |
|---|---|---|---|
| DATE | | 21.6.78 | 11JAN'79 |
| MOD. No | ~ | 94745 | 5243 |

| QTY. | — | SHT. 4 OF 4 | DWG. 4 | ML 0832021 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: FM. CORRECTION CB. | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSG520. | No. OFF | F 832 | DRAWN HRP | CHECKED

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | ISSUE |
|---|---|---|---|---|---|---|---|---|---|
| 103 | IC9 * | BOF | INTEGRATED CIRCUIT | ALT. | MC14024 CD4024 | | 1 | | |
| 104 | IC10 * | " | " | | uA F356 | | 1 | | |
| 105 | IC11 * | " | " | ALT | MC14066 CD4066 | | 1 | | |
| 106 | IC12 * | " | " | ALT | MC14069 CD4069 | | 1 | | |
| 107 | IC13 * | " | " | SILICONIX | DG200CJ | | 1 | | |
| 108 | IC14 * | " | " | FAIRCHILD | uA 356 | | 1 | | |
| 109 | IC15 * | " | " | ALT. | CA741CG uA 741 (DIL) | | 1 | | |
| 110 | IC16 * | " | " | ALT | MC14011 CD4011 | | 1 | | |
| 111 | IC17 * | " | " | ALT | MC14093 CD4093 | | 1 | | |
| 112 | IC18 * | " | " | ALT | MC14070 CD4070 | | 1 | | |
| 113 | IC19 * | " | " | ALT | MC14011 CD4011 | | 1 | | |
| 114 | IC20 * | " | " | ALT | MC14001 CD4001 | | 1 | | |
| 115 | IC21 * | " | " | ALT | MC14013 CD4013 | | 1 | | |
| 116 | | " | IC. PADS | CAMBION | 703_4014_01_04_12 | | 16 | | |
| 117 | | " | IC " | " | 703_4008_01_04_12 | | 4 | | |
| 118 | | " | " 16 PIN | " | 703-4016-01-04-12 | | 1 | | |
| 119 | | NOTE | HEF ICs MUST NOT BE USED ON THIS C'B | | | | | | |
| 120 | * IC's MUST NOT BE REMOVED FROM HOLDER EXCEPT WITH INSERTION TOOL | | | | | | | | |
| 121 | P1 | BOF | POTENTIOMETER 5kΩ | BECKMAN | 72P | | 1 | | |
| 122 | P2 | " | " 10kΩ | " | " | | 1 | | |
| 123 | | | | | | | | | |
| 124 | | | | | | | | | |
| 125 | | | | | | | | | |
| 126 | | | | | | | | | |
| 127 | | | | | | | | | |
| 128 | | | | | | | | | |
| 129 | | | | | | | | | |
| 130 | | | | | | | | | |
| 131 | | | | | | | | | |
| 132 | | | | | | | | | |
| 133 | | | | | | | | | |
| 134 | | | | | | | | | |
| 135 | | | | | | | | | |
| 136 | | | | | | | | | |
| 137 | | | | | | | | | |

| ISSUE | A | B | C | D | E |
|---|---|---|---|---|---|
| DATE | | 10-4-78 | 21.6.78 | 28 July 78 | 15 JAN 79 |
| MOD. No | ~ | 4621 | Q4745 | 4877 | 5243 |

| QTY. | – | SHT. 1 OF 2 | DWG 4 | ML 0832022 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: POWER SUPPLY CIRCUIT BOARD | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

| FARNELL INSTRUMENTS LTD. | No. OFF | F 832 | DRAWN | CHECKED |
|---|---|---|---|---|
| SSG520. | | | REP | J.M.D |

| ITEM No | REF. No. | ORIGIN OF PART | DESCRIPTION | | | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUED |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | BOF | CIRCUIT BOARD MASTER | | | 2220832132 | | 1 | | |
| | | | " " DRILLING | | | 2220832133 | | REF | | |
| | | | " " SCREEN | | | 2220832134 | | REF | | |
| | | | " " SOLDER RESIST SCREEN | | | 2220832135 | | REF | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | R1 | BOF | RESISTOR | 22kΩ 2% | MULLARD (C) | MR25 | | 1 | | |
| 5 | R2 | " | " | 3k9Ω " | " (C) | " | | 1 | | |
| 6 | R3 | " | " | 15Ω " | " (C) | " | | 1 | | |
| 7 | R4 | " | " | 4k7Ω " | " (C) | " | | 1 | | |
| 8 | R5 | " | " | SOT. " | " (C) | " | | 1 | | |
| 9 | R6 | " | " | 560Ω " | " (C) | " | | 1 | | |
| 10 | R7 | " | " | 8k2Ω " | " (C) | " | | 1 | | |
| 11 | R8 | " | " | 22kΩ " | " (C) | " | | 1 | | |
| 12 | R9 | " | " | 22kΩ " | " (C) | " | | 1 | | |
| 13 | R10 | " | " | 4k7Ω " | " (C) | " | | 1 | | |
| 14 | R11 | " | " | 2k2Ω " | " (C) | " | | 1 | | |
| 15 | R12 | " | " | 330Ω " | " (D) | " | | 1 | | |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | C1_3 | BOF | CAPACITOR | 1uf 63V | ADVANCE ALT. | A2B10218 MD20A | | 3 | | |
| 20 | C4 | " | " | 0.01uf 100V | WIMA | FKS2 MIN | | 1 | | |
| 21 | C5_7 | " | " | 2200uf 16V | " | PRINTILYT | | 3 | | |
| 22 | C8 | " | " | 1000uf 35V | " | " | | 1 | | |
| 23 | C9 | " | " | 1000 uf 63V | " | " | | 1 | | |
| 24 | C10 | " | " | 470 uf 63V | " | " | | 1 | | |
| 25 | C11 | " | " | 100 uf 40V | MULLARD | 016_17101 | | 1 | | |
| 26 | C12_14 | " | " | 0.1uf 250V | " | C280AE/P100K | | 3 | | |
| 27 | C15 | " | " | 10uf 63V | " | 016_18105 | | 1 | | |
| 28 | C16_20 | " | " | 0.1uf 250V | " | C280AE/P100K | | 5 | | |
| 29 | C21 | " | " | 100uf 25V | " | 016_16101 | | 1 | | |
| 30 | C22 | " | " | 33uf 40V | " | 016_17339 | | 1 | | |
| 31 | C23 | " | " | 47uf 40V | " | 016_17479 | | 1 | | |
| 32 | C24 | " | " | 0.1uf 250V | " | C280AE/P100K | | 1 | | |

| ISSUE | A |
|---|---|
| DATE | |
| MOD. No | ~ |

| QTY | – | SHT. 2 OF 2 | DWG. 4 | ML 0832022 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: POWER SUPPLY CIRCUIT BOARD | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

| FARNELL INSTRUMENTS LTD. | No. OFF | F 832 | DRAWN | CHECKED |
|---|---|---|---|---|
| SSC 520. | | | PEP | J.M.D. |

| ITEM No. | REF No. | ORIGIN OF PART | DESCRIPTION | | | PART No. | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|---|---|
| 33 | C25 | BOF | CAPACITOR | 100µF 40V | MULLARD | 016_17101 | | 1 | | |
| 34 | C26 | " | " | 0.1µF 250V | " | C280AE/P100K | | 1 | | |
| 35 | C27 | " | " | 220µF 35V | WIMA | PRINTILYT | | 1 | | |
| 36 | C28 | " | " | 10µF 25V | MULLARD | 015_16109 | | 1 | | |
| 37 | | | | | | | | | | |
| 38 | | | | | | | | | | |
| 39 | | | | | | | | | | |
| 40 | D1_16 | BOF | DIODE | | MOTOROLA | IN4003 | | 16 | | |
| 41 | D17 | " | " | © | TEXAS | IN4148 | | 1 | | |
| 42 | D18_22 | " | " | | MOTOROLA | IN4003 | | 5 | | |
| 43 | Z1 | " | ZENER DIODE | © | | ALT BZV12 OR BZV12. IN4576 | | 1 | | |
| 44 | | | | | | | | | | |
| 45 | | | | | | | | | | |
| 46 | | | | | | | | | | |
| 47 | VT1_2 | BOF | TRANSISTOR | | TEXAS | BC212L | | 2 | | |
| 48 | | | | | | | | | | |
| 49 | | | | | | | | | | |
| 50 | | | | | | | | | | |
| 51 | P1 | BOF | POTENTIOMETER | 1kΩ | BECKMAN | 72P | | 1 | | |
| 52 | P2 | " | " | 2kΩ | " | 72P | | 1 | | |
| 53 | | | | | | | | | | |
| 54 | | | | | | | | | | |
| 55 | | | | | | | | 1 | | |
| 56 | IC4 | BOF | * INTEGRATED CIRCUIT | | MOTOROLA | MC7724CP | | 1 | | |
| 57 | IC5 | " | * " " | | ALT. | CA741CG µA741 (DIL) | | 1 | | |
| 58 | IC6 | " | * " " | | MOTOROLA | MC79L15CP | | 1 | | |
| 59 | | " | * IC. SOCKET | 8WAY | CAMBION | 703_4008_01_04_12 | | 1 | | |
| 60 | | " | CLEAR SPACER | 6BA x ¼" | | R6081 | | 2 | | |
| 61 | | | BRACKET | | | 4-5943 | | 2 | | |
| 62 | | BOF | POWER SUPPLY SOCKET | | PLESSEY | 74/10/1556/10 | | 1 | | |
| 63 | | | | | | | | | | |
| 64 | | | | | | | | | | |
| 65 | | B1 | CB. PIN | | TUCKER | | | | | |
| 66 | | | | | | | | | | |
| 67. | | * | IC MUST NOT BE REMOVED EXCEPT WITH INSERTION TOOL | | | | | | | |

| ISSUE | A | B | C |
|---|---|---|---|
| DATE | | 14.4.78 | Q4745 |
| MOD No | ~ | Q4642 | |

QTY. 1 | SHT 1 OF 1 | DWG. 4 | ML 0832023

USED ON U.K.832 | ASSEMBLY TITLE: WIRE PREP

TO BE KIT BY MARSHALLED | KIT MARSHALLED ON

FARNELL INSTRUMENTS LTD. | No. OFF | F 832 | DRAWN C.L.W. | CHECKED

SSG520

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUED |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | B.O.F. | CONNECTOR BLOCK 30 WAY | AMP | 480146-7 | | 1 | | |
| 2 | | " | PLUG 15WAY | PLESSEY | 74/10/1501/10 | | 1 | | |
| 3 | | " | RETAINING SPRING | AMP | 42973-1 | | 7 | | |
| 4 | | " | INTER CONTACT KEYING PLUG | AMP | 582501-1 | | 1 | | |
| 5 | | | | | | | | | |
| 6 | | B.I. | LEAF CONNECTOR | AMP | 153782-2 | | 109 | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | BI. | WIRE BLACK | PERMANOID | 14/12 VX PVC | | 0·98M | | |
| 11 | | " | " RED | " | " | | 2·6M | | |
| 12 | | " | " GREY | " | " | | 4·8M | | |
| 13 | | " | " YELLOW | " | " | | 6·53M | | |
| 14 | | " | " ORANGE | " | " | | 6·94M | | |
| 15 | | " | " PINK | " | " | | 9·42M | | |
| 16 | | " | " VIOLET | " | " | | 7·63M | | |
| 17 | | " | " WHITE | " | " | | 6·3 M | | |
| 18 | | " | COAX CABLE | | RG174 | | 12·8 M | | |
| 19 | | " | 4 CORE SCREEN | | EHE 4PR | | 1·27 M | | |
| 20 | | " | 2 CORE SCREEN | | 367-230 | | 1·13 M | | |
| 21 | | " | WIRE BLACK | PERMANOID | 16/20 VX PVC | | 11·27M | | |
| 22 | | " | " RED | " | " | | 1·98M | | |
| 23 | | " | " GREY | " | " | | 0·39M | | |
| 24 | | " | " YELLOW | " | " | | 0·24M | | |
| 25 | | " | " ORANGE | " | " | | 0·37M | | |
| 26 | | " | " PINK | " | " | | 0·21M | | |
| 27 | | " | " VIOLET | " | " | | 0·38M | | |
| 28 | | " | " WHITE | " | " | | 0·22M | | |
| 29 | | " | " BROWN | " | " | | 0·21M | | |
| 30 | | " | " BLUE | " | " | | 0·21M | | |
| 31 | | " | " GREEN/YELLOW | " | " | | 0·59M. | | |
| 32 | | " | BLACK RUBBER SLEEVE | HELLERMAN | C15 x 3/4" | | 7 | | |
| 33 | | " | " " " | " | C25 x 3/4" | | 35 | | |
| 34 | | " | RED RUBBER SLEEVE | " | C15 x 3/4" | | 8 | | |
| 35 | | " | " " " | " | C25 x 3/4" | | 16 | | |

SUP A

DATE

MOD No 2

| QTY. | SHT 1 OF 1 | DWG. 4 | ML 0832024 |
|---|---|---|---|
| 1 | | | |

USED ON U.K.832

# PROGRAMMABLE OPTION KIT
MARSHAL ONLY ON INSTRUCTIONS FROM TEST.

ASSEMBLY TITLE: WIRE PREP.

TO BE KIT BY MARSHALLED

KIT MARSHALLED ON

FARNELL INSTRUMENTS LTD.

No. OFF

F 832B.

DRAWN C.L.W

CHECKED

SSG520

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | | PART No. | ISSUE | QUANTITY PER | QUANTITY TOTAL | QUANTITY ISSUE |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | B.O.F. | SOCKET | AMPHENOL | 57-40500 | | 1 | | |
| 2 | | " | PLUG | AMPHENOL | 57-30500 | | 1 | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | B.I. | LEAF CONNECTOR | AMP | 153782-2 | | 28 | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | B.I. | WIRE RED | PERMAVOID | 14/·12 VX PVC | | 2·4M | | |
| 10 | | " | " GREY | " | " | | 2·1M | | |
| 11 | | " | " YELLOW | " | " | | 5·6M | | |
| 12 | | " | " ORANGE | " | " | | 5·6M | | |
| 13 | | " | " PINK | " | " | | 5·57M | | |
| 14 | | " | " VIOLET | " | " | | 5·26M | | |
| 15 | | " | " WHITE | " | " | | 0·76M | | |
| 16 | | " | " BLACK | " | " | | 0·13M | | |
| 17 | | | | | | | | | |
| 18 | | F.I. | LOOM | | LB369 | | REF. | | |
| 19 | | | | | | | | | |
| 20 | | | | | | | | | |

| ISSUE | A |
|---|---|
| DATE | |
| MOD No | |

| QTY. | — | SHT 1 OF | DWG. 4 | ML 0832025 |
|---|---|---|---|---|
| USED ON | UK832 | ASSEMBLY TITLE: CASING | | |
| | | TO BE KIT BY MARSHALLED | KIT MARSHALLED ON | |

FARNELL INSTRUMENTS LTD. SSG 520. | No. OFF | F 832 | DRAWN REP | CHECKED

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | PART No | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|
| 1 | | FI | TOP COVER | 1000 832 233 | | 1 | | |
| 2 | | " | BOTTOM COVER | 1000832234 | | 1 | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | BOF | FOOT ASSEMBLY VERO | 50/0067A | | 1PAIR | | |
| | | | MODIFIED BY FI. TO DRG Nº 3AE0832242 | | | | | |
| 8 | | | | | | | | |
| 9 | | BOF | MAINS CABLE BELLING LEE | L1497 | | 1 | | |
| 10 | | " | MAINS PLUG | 13A DURAPLUG | | 1 | | |
| 11 | | " | N_BNC ADAPTER RADIALL | UG/201A/U | | 1 | | |
| 12 | | " | 20dB PAD TEXSCAN | PP50 | | 1 | | |
| 13 | | " | BNC_BNC CABLE 3' SÜHNER | 4_7154 TYPE C | | 1 | | |
| 14 | | " | BNC_OPEN END CABLE 4' " | 4_5158 TYPE A | | 1 | | |
| 15 | | " | BOARD PULLER | 4003114003 | | 1 | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | " | SERIAL NO. LABEL | 4000832253 | | 1 | | |
| 20 | | | | | | | | |
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| 34 | | | | | | | | |

| ISSUE | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| DATE | | Q4693 | Q4893 | Q4962 | 7-12-78 | 29-1-79 | 3-2-79 |
| MOD. No | ~ | 23/5/78 | 18/9/78 | 3/10/78 | Q5167 | 5250 | Q5329 |

QTY 1 | SHT OF | DWG 4 | ML 0832026

USED ON U.K.832E

# RACK MOUNTING OPTION: KIT MARSHAL ONLY ON INSTRUCTIONS FROM TEST.

ASSEMBLY TITLE: RACK MOUNTING OPTION

TO BE KIT BY MARSHALLED | KIT MARSHALLED ON

FARNELL INSTRUMENTS LTD. | No. OFF | F 832E | DRAWN C.L.W. | CHECKED

SSG520 – RACK MOUNTED

| ITEM No | REF. No. | ORIGIN OF PART | DESCRIPTION | PART No | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|
| 1 | | F.I. | RACK MOUNTING SIDE | 2AG0832221 | | 2 | | |
| 2 | | " | RACK MOUNTING BARS | 3AG0832222 | | 2 | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | BOF. | HANDLE IMHOF – BEDCO | TYPE GA | | 2 | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | B.I. | SCREW M4x10 C'SK HD. POZI DRIVE | | | 4 | | |
| 9 | | " | " M2·5x8 C'SK HD. POZI DRIVE | | | 8 | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |

ISSUE A

DATE 4/8/78

M.O. No. Q4877

MATERIAL LIST — FARNELL INSTRUMENTS LTD.

QTY. | USED ON UK832

SHT. 1 OF 1 | DWG. 4 ML 0832027

ASSEMBLY TITLE: REVERSE POWER PROTECTION

TO BE KIT BY MARSHALLED | KIT MARSHALLED ON

INSTRUMENT: SSG 520 OPTION 'D' | No. OFF | F832 | DRAWN: RH. | CHECKED

| ITEM No. | REF. No. | ORIGIN OF PART | DESCRIPTION | PART No. | ISSUE | QUANTITY PER | TOTAL | ISSUED |
|---|---|---|---|---|---|---|---|---|
| 1 | | F1. | REVERSE POWER PROTECTION BASE PLATE | 3CJ0832262 | | 1 | | |
| 2 | | " | " " " DIVIDER 'A' | 4CJ0832263 | | 1 | | |
| 3 | | " | " " " DIVIDER 'B' | 4CJ0832264 | | 1 | | |
| 4 | | " | " " " END PLATE 'A' | 4CJ0832265 | | 1 | | |
| 5 | | " | " " " END PLATE 'B' | 4CJ0832266 | | 1 | | |
| 6 | | " | " " " COVER | 4CJ0832267 | | 1 | | |
| 7 | | | | | | | | |
| 8 | R1 | BOF. | RESISTOR 1SK MULLARD | TR6 | | 1 | | |
| 9 | R2 | " | RESISTOR 1M MULLARD | CR25 | | 1 | | |
| 10 | R3 | " | " 4K7 " | MR25 | | 1 | | |
| 11 | C1 | BOF | CAPACITOR 1500 PF 160V Wima. | FKC-3 | | 1 | | |
| 12 | C2 | " | CAPACITOR 120 PF ERIE | 861 | | 1 | | |
| 13 | C3 | " | CAPACITOR 120 PF ERIE | 861. | | 1 | | |
| 14 | C4 | " | FEEDTHROUGH. ERIE | 124-001 | | 1 | | |
| 15 | C5 | " | FEEDTHROUGH. ERIE | 124-001 | | 1 | | |
| 16 | | | | | | 1 | | |
| 17 | VT1 | BOF | TRANSISTOR MOTOROLA | MPS A13 | | 1 | | |
| 18 | | | | | | | | |
| 19 | D1 | BOF | DIODE TEXAS | 1S922 | | 1 | | |
| 20 | D2 | | DIODE TEXAS | 1S922 | | 1 | | |
| 21 | | | | | | | | |
| 22 | RL1 | BOF | RELAY TELEDINE | 712-26 | | 1 | | |
| 23 | | | | | | | | |
| 24 | L1 | BOF | FERRITE BEAD MULLARD | FX1115 | | 1 | | |
| 25 | | | | | | | | |
| 26 | | BOF | LEADTROUGH FEC | FTSM16PS1. | | 3 | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |

| ISSUE | A | B | C |
|---|---|---|---|
| DATE | 29-9-78 | 8-11-78 | 21-3-79 |
| | | Q5077 | Q5417 |

MP MASTER
MA23448